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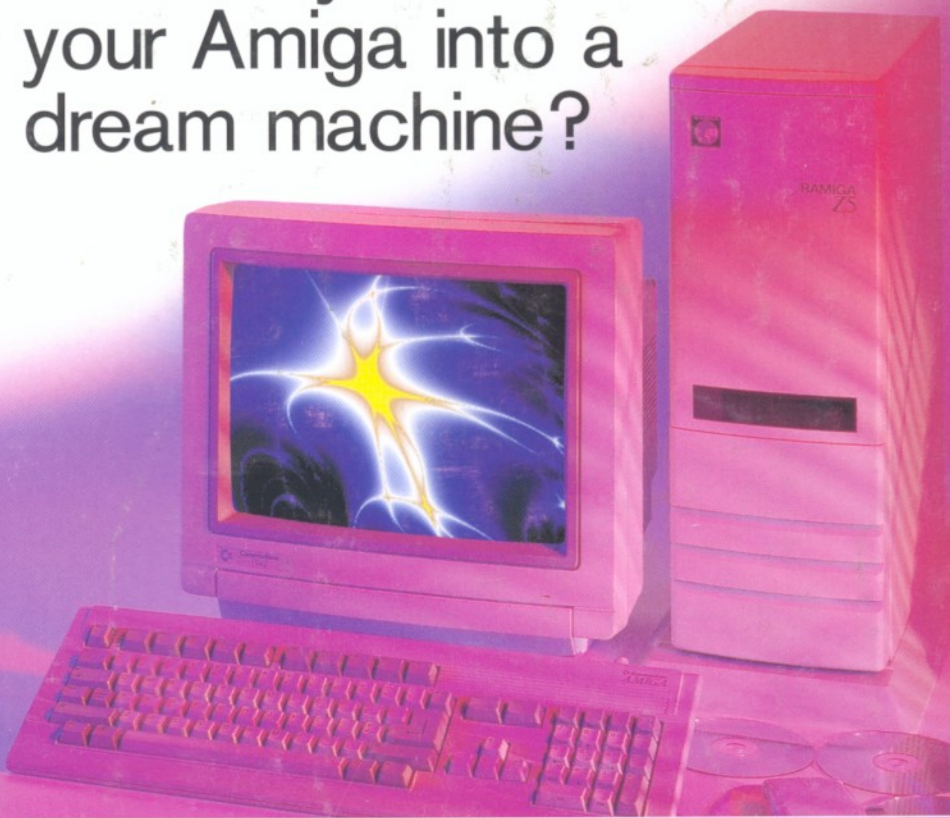
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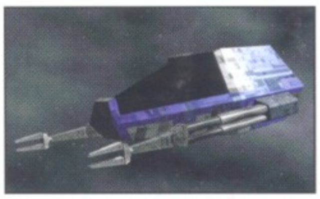
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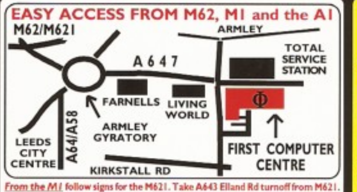
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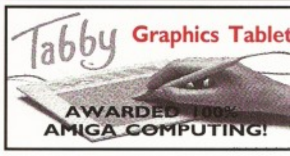
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47 Inside issue

Welcome to the rebirth of Amiga Shopper. We felt that it had become a little set in its ways and it was time for a bit of a shake up...

And what a shake up! Not only have we completely redesigned the magazine, but we have attached two feature-packed Coverdisks to the front of the issue too. Plus we've gone full colour throughout and we have even increased the number of pages in the magazine.

Every issue of Amiga Shopper from now on will have two Coverdisks firmly attached to the cover – if you are a subscriber, you'll still get the Subscribers' disk sent to you every issue too, which makes for a grand total of three disks every month.

We will search high and low to bring you the best software we can find to put on the disks. Both the Coverdisks will always be full to the brim with demo versions of the most exiting new software releases, other useful programs and utilities, listings from the various tutorials featured in each issue; and every month we will include a selection of Public Domain programs on one of the Coverdisks.



Getting back to the magazine itself, in this month's issue we have the new Ramiga Z5 A1200 and Z7 A4000 'towers' reviewed by ex-Amiga Shopper editor Richard Baguley. Is this long-awaited piece of kit all that its cracked up to be? Find out on page 20. David Haynie has produced a massive 10-page Supertest of every currently available programming language, which starts on page 30.

On page 28, R Shamms Mortier talks to Brett Casebolt from Natural Graphics and takes him through the making of Scenery Animator, the brilliant fractal scenery generating program.



We have the usual in-depth tutorials written by experts in their particular fields. This month the C programming, Chess and Assembler tutorials feature on Coverdisk 2, along with all their relevant listings, so if you missed an instalment of these tutorials you can find it on the disk.

Star buy

And, we have a huge 10 pages devoted entirely to Amiga Shopper's 100 best Public Domain programs and utilities ever, which has been compiled by Amiga Format's PD expert, Jason Holborn – check out page 92.

You'll find that every review in this issue has been rated out of 100 per cent. No change there, but now we have a new Amiga Shopper Star Buy logo. Any product that get marks of 90 per cent or more in our reviews is given one. You can easily tell which ones they are because they will have the logo pictured above somewhere on the review.

And, please, make sure you take the time to fill in our Reader Survey on page 49 and send it in to us. Without us knowing who you are and exactly what you want from your Amiga and your Amiga magazine, we can't make sure that we are giving you the best value for your money.

I am delighted to have the opportunity to edit the new-look Amiga Shopper and I would welcome any ideas you may have concerning features that you would like to see in Amiga Shopper, or your comments and suggestions on how to improve your favourite Amiga magazine.

Read on and enjoy!

(The Amiga Shopper team would just like to say: We've worked bloody hard on this issue. You'll find us in Hatchetts with fry-ups and beer.) ■

Sue Grant, Editor.

Turn the page for contents of issue **47**

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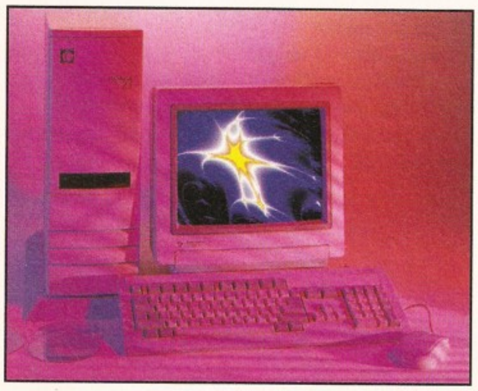
AMIGA SHOPPER

Shopper**Features**

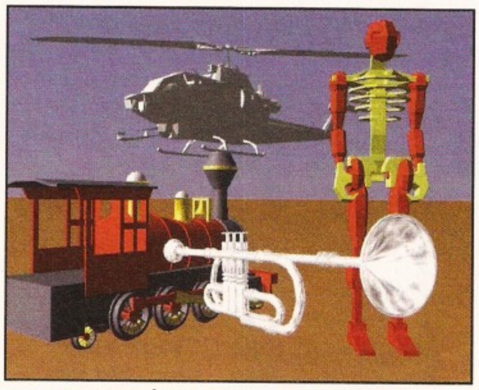
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Shopper**Tutorials**

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20 *Is Ramiga's Z5 system the answer to your power problems? Find out here!*

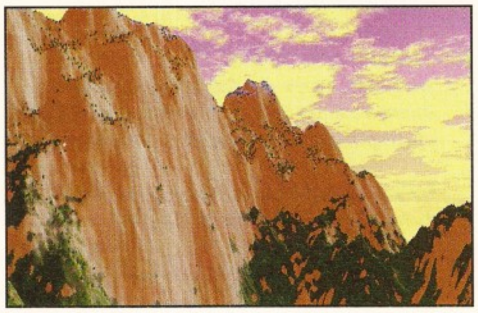


43 *One of the many images from the Almathera Amiga Desktop Video CD.*

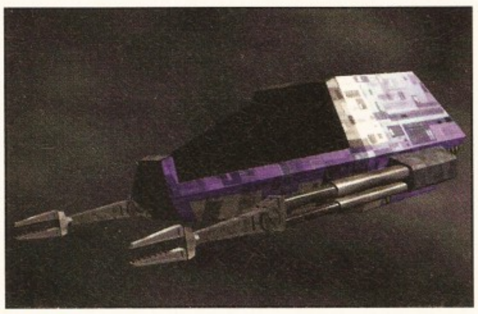


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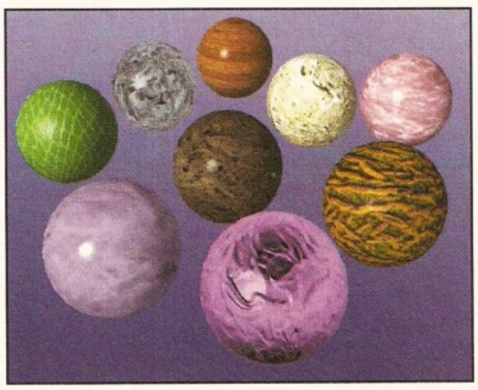
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Shopper**Disks** – turn to page 6



Boy, oh boy, have we got a treat for you! This month's Coverdisk 1 contains a very special version of DICE 3.0.

On our second disk, ShopperChoice, there's oodles of useful files and programs, including a database of every single Amiga Shopper since its launch and *all* the listings from our tutorials – no more tedious typing!



Disk instructions

Boy oh boy, have we got a treat for you this month! **Toby Simpson** *explains how to get that specially prepared version of DICE on the Coverdisk 1 to work without you having to tear your hair in desperation.*

Where to get DICE

save £30 **You can save over £30 when you buy the full version of our DICE Coverdisk by turning to Amiga Shopper's Mail Order bargains on page 52.**

DICE is distributed in Europe by Fourth Level Developments. They can be contacted by post, fax, phone or E-mail:
Fourth Level Developments,
31 Ashley Hill, Montpelier,
Bristol, BS6 5JA, England.
Tel: 0117 955 8225
Fax: 0117 955 9157

E-mail – for sales enquiries:
dicecsales@flevel.demon.co.uk
For general information and enquiries:
dicecinfo@flevel.demon.co.uk

There is an automatic E-mail mailing list as well. To subscribe to this, E-mail:
emailurl@flevel.demon.co.uk
...and include following lines in the body of the message:
subscribe
my_user_name@my.email_address
end
For example, if you are on CIX and you wish to subscribe, you would use this line:
subscribe
my_cix_user_name@cix.compulink.co.uk
end

The full version of DICE C is £129.25, which includes VAT. You can also upgrade a previous registered version of DICE C 2 for £96.93 (including VAT) – you need your DICE 2 registration number to do that. There is also a special deal for students – £96.93. You will need some evidence of your student status to take advantage of this offer.

For more information, including an order form which you can print out, see the files "Readme" and "Upgrade" on DICE disk 3. You can double-click on these files to view them, or load them into a word processor such as Wordworth 3 to read.

Unless they fell off in the newsagents, or you've opened Amiga Shopper at this page first, then you must have noticed those two square things stuck to the front of your magazine. These, not too surprisingly, are our Coverdisks, and we're getting off to a fine start by including a specially prepared and compressed (it will go on three disks when de-compressed) version of the DICE C compiler, by Obvious Implementations Corp, in America.

If you have been following my C programming course, or Cliff Ramshaw's Chess series, then you will already be aware of DICE, and you probably already have one of the versions we have given away before, or perhaps you bought "Complete Amiga C". In all of these cases you may forgiven for thinking "So. You've done this before, I already have it." Bzzzzz! Wrong answer! This is DICE version 3, the first fully commercial version of the compiler and it is very nice indeed.

Obviously the authors of DICE wouldn't make much money if we gave away the whole product, so this month's Coverdisks contain a special cut-down version. It has the following limitations:

- You can't use bitfields or floating point.
- The maximum executable program size is 40K.
- Each source file can only have up to four functions in it.
- You can't use this version of DICE to generate commercial applications, or for work purposes. It is for the private home usage by Amiga Shopper readers *only*.

There are also some other minor limitations, details of which can be found in the file "Readme" on DICE disk 3.

If you intend to learn C on a slightly more serious basis, you will almost certainly wish to upgrade to the full version (see the box on the left for information on Amiga Shopper mail order bargains, including the full version of DICE at a *very* special price), which has none of the above restrictions, and comes with loads of additional goodies, including the following:

- A 450 page manual.
- The full version Include files for Kickstart 1.3, 2 and 3.
- A code profiler which allows you to see which parts of your program take the most time to run. This helps a lot when attempting to optimise your program.
- Online help which covers just about everything bar the kitchen sink.
- An alternative text editor to use for writing your source code, and heaps of other tools, and source code for a number of the DICE components (such as the linker libraries, for example).

Using your Coverdisks

Fortunately, installation is a breeze. We'll look at the installation process for both hard disk and floppy disk users.

Floppy disk users

If you only have one floppy drive, you may find using DICE a bit of a pain, because of the large amount of disk-swapping that will be involved. Extra drives cost very little, so you should consider buying one of those. If you have enough RAM, you could consider creating a floppy disk-sized recoverable RAM disk, copying the contents of disk 1 on to that and booting directly from it instead of the disk. If you are not sure of how to go around this, have a look in your Amiga manuals.

A recoverable RAM drive can be very useful indeed – it works just like a RAM disk, but it survives a re-boot of your Amiga. Obviously, it won't live past a full power-off/on re-set, but it *does* mean that for those long, late-night programming sessions you will only need to do the initial copy to your recoverable drive (RAD:) once when you start. Most good PD libraries, and online services such as CIX, have

What is 'C' anyway?

If you have never programmed in C before, but are still interested, don't panic! C is one of the most popular programming languages today, both in professional and hobbyist circles. This stems from the fact that it is so flexible and was designed with computers in mind, rather than human beings. The drawback of this is that C has some pitfalls which are easy to fall into, and badly written C programs look awful. The advantage is that the programs you write in C will be very efficient.

So, what is a computer anyway? Well, it's one of the most amazingly simple electronic gadgets around. From the moment you switch your computer on to the moment you switch it off, it simply goes through a list of very simple instructions and performs them one at a time. These operations include things like adding two numbers together, or moving some information from one place to another inside your computer's memory. These instructions are called machine code.

Machine code is rarely programmed these days, because it consists of a lot of numbers which are impossible to remember and it's painfully hard to solve problems when something goes wrong. In the old days, programming a computer consisted of using a lot of switches and buttons (not *that* long ago, actually). Home computers were still being programmed in this fashion as late as the early '80s.

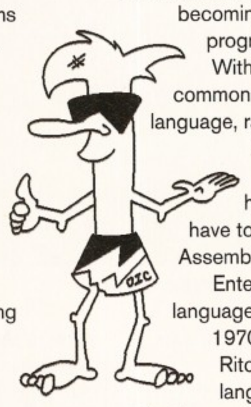
Fortunately, things have moved on and Assembly language arrived to make life easier for machine code programmers. In Assembly language, programmers wrote down mnemonics instead of the numeric values for instructions. For example, "add" could be used instead of the number code. A specially-written program then translated the Assembly language directly to machine code which could be run by the computer.

The stuff the programmer wrote is called "source code" and the program which can actually be run on the computer, which the Assembler generates, is called the "object code".

The thing with Assembly language is that for every Assembly command you write, exactly one machine code instruction is generated. You are actually programming the microprocessor Chip itself (in the Amiga's case, this is a member of the 68000 series of Chips by Motorola).

The advantage of this is the control you get. You decide exactly which instructions the microprocessor will execute, your programs will usually be fast, compact and efficient.

A side effect is that since machine code is made up of such simple operations, it takes a whole bunch of them to do even the simplest thing. As a result of that, programs take longer to write, are harder to read and to fix when things go wrong. Assembly language is known as a "low-level programming language".



In the long quest to make programming easier, "high-level languages" were developed in the 1960s (such as BASIC and PASCAL, which you may have heard of). These were designed to be more user-friendly. Some of these languages were interpreted. An interpreted language requires a special program which looks through the source code and acts on each operation, converting it to machine code as it goes.

This is a slow process and it means that any programs you write will need the interpreter in order to run. ARexx on the Amiga is an interpreted language. Other high-level languages were compiled instead. This involved a program called a compiler which would translate your entire high-level language source code into an object file, which can be run directly by the computer.

Unlike Assembly language, where each source instruction translated to one machine code instruction, in the case of high-level languages, each source line can potentially convert to tens (or indeed hundreds) of machine code instructions. It is a pay-off. The advantages of high-level languages are great. They are easier to learn, quicker to program in and easier to fix when things go wrong. Programs written in Assembly language tend to result in smaller object code files, and are usually smaller and more efficient than their high-level counterparts.

The other side to this is that compilers are getting much better, and microprocessors are becoming more complex and harder to program in Assembly language.

With all this in mind, it makes good common sense to learn a popular high-level language, rather than going to the effort of Assembly language (particularly as future Amigas may not even have 68000 Chips, and you'd then have to learn an entirely new dialect of Assembly language).

Enter stage left, the 'C' programming language. 'C' was developed in the early 1970s by Brian Kernighan and Dennis Ritchie. It learnt from lots of other languages which were floating around at the time and they came up with something which was a powerful high-end language, but actually lent itself well towards being compiled efficiently.

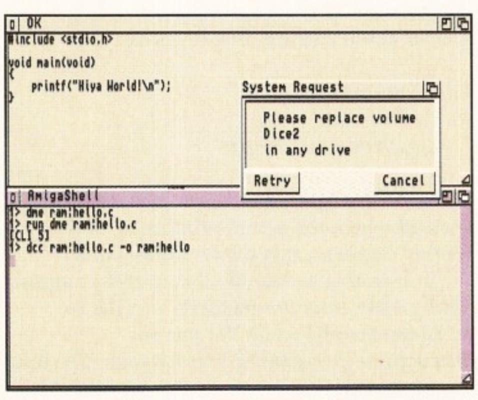
C has become incredibly popular and, in 1988, ANSI (American National Standards Institute) agreed on a standard for C, which became the De-Facto dialect to program in. Further developments have led to an object orientated version of C called C++, but that is the subject of a book and series of articles on its own, so we'll skip past that!

Most of the operating system in the Amiga has been written in C. Intuition, Workbench, and most of the utilities you use are all written in C. It's 99 per cent certain that every major Amiga application you have was written in C.

So, with this lot in mind, if you're thinking of learning just one programming language in your life, C is not a bad one to stick to.

a good alternative to RAD called Stat-RAM. This comes with full installation instructions and an AmigaGuide help file and is heartily recommended.

Coverdisk 1 is bootable. Floppy users should boot off disk 1. This will set up everything you need, and give you access to a Shell window also. Assuming you have more than one drive, you can put disk 2 into that and eliminate disk-swapping during compilation.



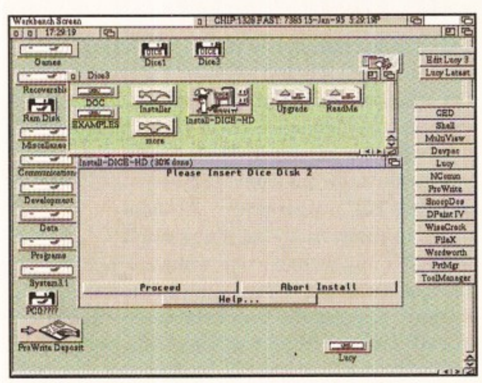
The curse of using one floppy disk; continual disk-swapping when compiling programs.

One last note for users without hard drives, please, please, please, consider going out and buying one as soon as you can afford to. Unless you only play games (and if you're reading Amiga Shopper you are bound to be doing something serious with your Amiga), you will find that a hard drive will totally transform your Amiga. Leaf through the advertising pages of Amiga Shopper this month and check out the prices.

You really want at least 80Mb, but, if you can afford it, I'd recommend about 200Mb as being about right for average use. Now proceed to the bit overleaf headed "Getting started".

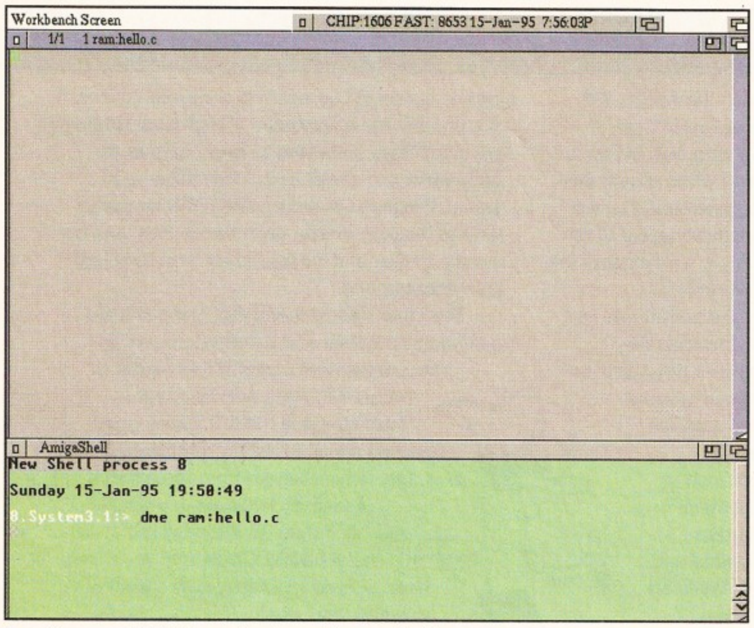
Hard disk users

DICE and, indeed, any decent programming language or environment are best used with a hard disk. Boot off your hard drive and insert DICE disk 3 into your internal floppy. If you double-click on the drive icon, and then the "Install-DICE-HD" icon, the standard Commodore installer will appear. Follow instructions on screen to install DICE.

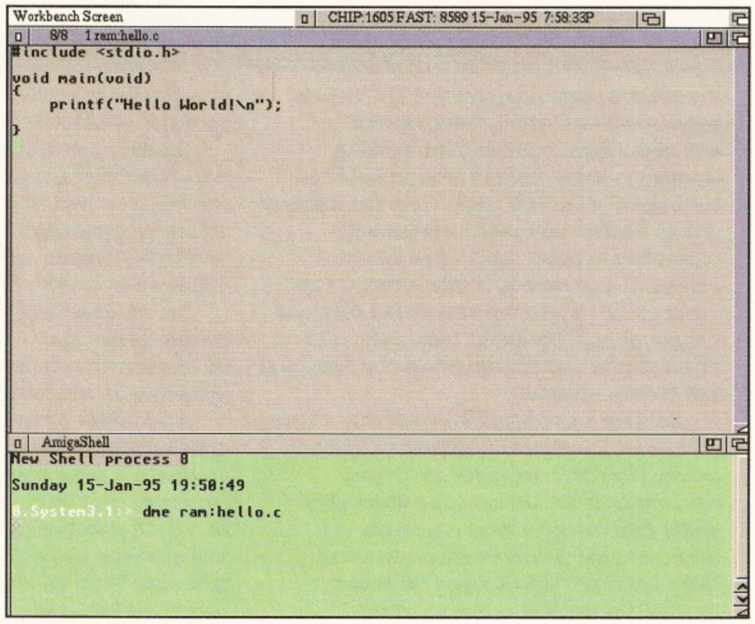


Installing DICE 3 to a hard drive.

If you are currently using a previous version of DICE, the documentation



Loading up DME in order to write our first program.



It's all typed in and ready to rock and roll!

7 recommends that you first remove the Assigns for that from your user-startup to avoid possible conflicts. Bear in mind that this is not a full version and has some limits.

If you already use DICE to write complex programs, keep your old version, or you may not be able to compile anything you've already written until you buy the full version of DICE 3.

The hard disk installation script will then add a couple of lines to your user-startup file to ensure everything is set up correctly for DICE to be used. Read carefully everything that Installer prompts you to do to avoid making a pickle of things.

Once you've finished installing DICE to your hard disk, you are ready to rock 'n' roll. It's probably best to re-boot your Amiga just to be sure everything takes effect as it should do. You are now ready to make a start.

Getting started

If you're not familiar with programming, but want to give it a crack anyway, I recommend you start by reading the "What is 'C' anyway?" box (on page 7) to give you a bit of background as to what it's all about. Then, follow this section through carefully and we'll write our very first DICE C program – hurrah!

As is compulsory for every single C programming tutorial ever written since the dawn of mankind, we're going to knock up a program to print the immortal words "Hello World!" on your Shell window. Hold back your enthusiastic excitement as long as you can and let's make a start!

The first thing to do is to write the source code to our program itself. Start by opening a Shell window. Then, type the following:

```
dme ram:hello.c
```

This will load up the text editor, which is supplied with DICE, called DME, and create a new file called "hello.c" in the RAM disk. Now type in the following very carefully, checking for errors. Use the TAB key to indent the line starting "printf":

```
#include <stdio.h>
void main(void)
    printf("Hello World!;
```

Now double-check that you have not made any mistakes, then select "Save" from the "Project" menu. Then, finally, select "Quit".

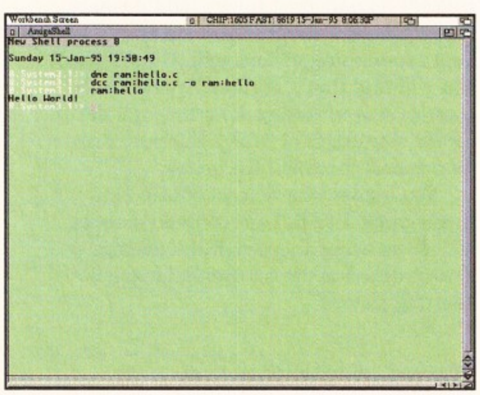
The editor will now exit, and you will be returned to the Shell window. Type in the following carefully:

```
dcc ram:hello.c -o ram:hello
```

If nothing has gone wrong, a few seconds should pass (or a bit longer for floppy users) and your Shell prompt should re-appear.

If any messages appear, then you will have made a mistake. Go back to the bit above with the editor, and check for typing errors. The message you get should give you a clue to the problem that has occurred.

Right, now our first program has been compiled. DCC is a neat tool which does all the work of compiling and linking your program for you. Linking is a final stage which puts everything together



Our first program, created, compiled and, hopefully, working first time.

before generating a program file which you can actually run.

In this case, we have used the "-o" option of DCC to specify where this program goes, and what it is called. We asked for a program called "hello" in the RAM disk to be created. We can now run and try our program by typing:

```
ram:hello
```

You will now get the earth-shattering message "Hello World!" on the screen! You should have noticed that we have created our program in the RAM disk. You can put it anywhere you like. Whilst first experimenting, I recommend that you create a separate drawer on your hard drive (or format a blank floppy disk for your source code) and put everything there.

As you get more experienced and create larger projects, you may want to start using the full environment which DICE provides you with, which includes full debugging facilities and the ability to see which parts of your program are the slowest. (It helps when deciding where to optimise!) DICE also allows you to manage your project from the Workbench. In a future issue of Amiga Shopper, we will look at advanced usage of DICE.

Nice one! So, that's our first working C program out of the way. Let's look at it in greater detail and see how it works.

```
#include <stdio.h>
void main(void)
    printf("Hello World!;
```

From looking at it directly, you should have guessed where the actual printing of "Hello World!" happens; it is on the printf() line.

In fact, this is the only line in this program. All the other ones are required in order to make the printf() work. We put our instructions between the brace marks. The line before the opening brace mark looks like this...

```
void main(void)
```

...but what does it all mean? In C, we group instructions together into functional groups called, funnily enough, functions.

Each function has a specific purpose and may call other functions in order to achieve its goal. It is not like BASIC, or Assembly language, where the program starts at the beginning and works its way through – in C, you must specify where the program should start.

This initial function, which is called when your program is run, is called main. In the example program, we define our main function as taking no initial parameters and it returns nothing of value.

These two bits of information are indicated with void statements. The first void tells the compiler what value this function is going to return, if any. In this case, void, or nothing. The bit in brackets defines what sort and how many parameters this function requires in order to run.

In our case, we don't need to know anything to print Hello World! on the screen, so we use void for our parameters, which means none.

Run that by me again!

So, to briefly recap, we have defined a single function called main(), which takes no parameters, and returns no result, which consists of one line:

```
printf("Hello World!;
```

This line is the one that actually shows the string itself. "printf" is the name for a function which we can use to show information on the screen inside Shell windows. This function is part of the ANSI-C standard IO (Input/Output) library.

In order to use it, we have had to include a special file at compilation time called "stdio.h". This is what the first #include line in the program does. Once compiled and run, our program will start at the first line of our main() function. When main() finishes, the program will exit. That is really all there is to it.

It's worth, just briefly, nipping back to the printf line and breaking that down:

```
printf("Hello World!;
```

The printf bit is the function name and everything within brackets is the parameter to supply to that function. The semi-colon at the end of the line indicates that this is the end of this C statement.

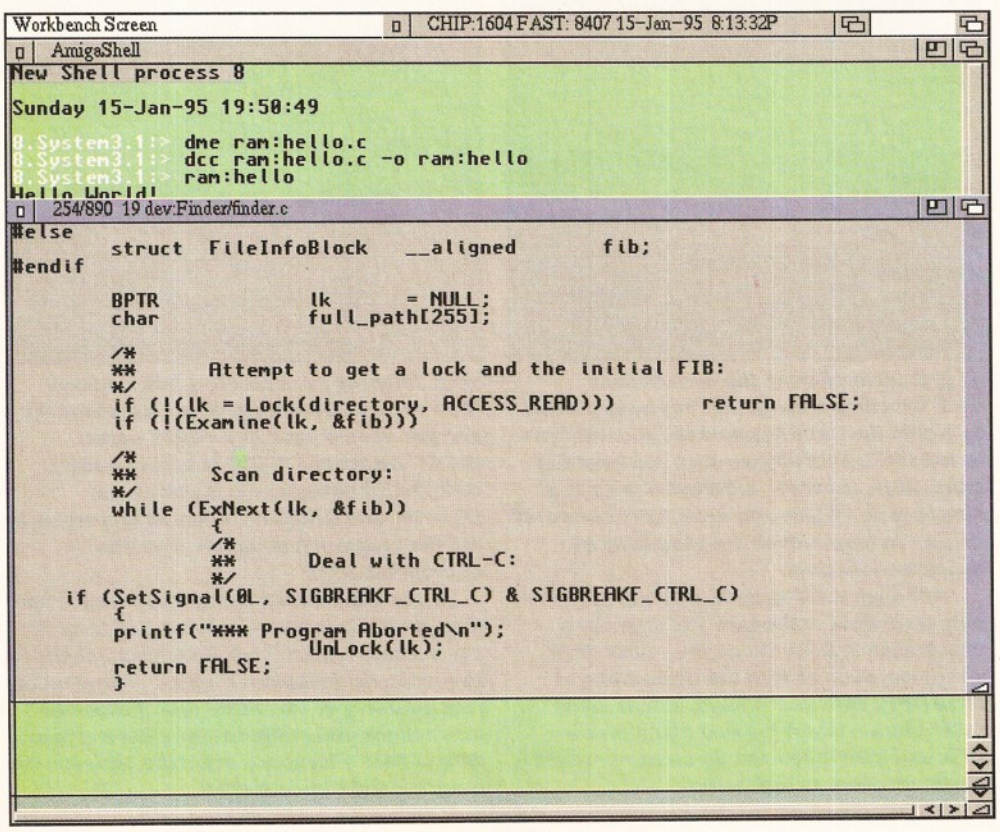
A common error for beginners is to forget the semi-colon, so be careful. The stuff in inverted commas is the string to print on the screen. The character at the end is a control character and means "put a new line here". We could put...

```
printf("Hello;
```

...and get Hello and World! on separate lines if we wanted.

If you want to try something a bit more interesting, you could try to type in, compile and run this one:

```
#include <stdio.h>
void main(void)
    int   i;
    for (i = 0; i < 10; i = i +1)
         printf("Hello World, loop %d;
```



Working on this month's Finder program using DME.

What else is there?

Not that much – once DICE was packed on to three disks (and then compressed on to one Coverdisk), there wasn't much more space! However, on DICE disk 2 there are a couple of things of interest. There are two drawers that are not part of the DICE program. These are:

disk2:Finder/

This contains this month's C programming program, a useful ARexx Shell and an executable version of the latest Finder program. See the C programming course, starting on page 86.

There is also the drawer...

disk2:Listings/Assembler/

...which contains this month's Assembler listing, a rather amusing lottery-number generator which comes up with those lucky(?) number combinations. To find out more, see the Assembler course on page 84.

Advanced C programmers could optimise this a great deal. You should see 10 Hello Worlds, together with a counter number after each one.

Knowing that this will be shown 10 times, from 0 to 9, you should be able to see what is happening above. Try tweaking the numbers and seeing what happens.

I wish you the best of luck with C programming. It can be immensely satisfying, like any programming, when you succeed. All you need is a bit of patience, and spare time, and you can do it. I recommend that if you get into this, you upgrade to the full version of DICE 3 as soon as possible, and buy the following books:

- Second Edition: The C Programming Language. By Brian Kernighan and Dennis Ritchie. ISBN 0-13-110362-8.

It costs about £30 and it is seriously worth its weight in diamond-studded gold with platinum linings.

For Amiga specific C stuff, and a chance to fiddle with windows and stuff, I recommend:

- The Amiga ROM Kernel Reference Manual: Libraries. Edition 3.
ISBN 0-201-56774-1. It costs around £30.

Neither of these two books are particularly friendly, but they are certainly essential. ■

Dodgy disk?

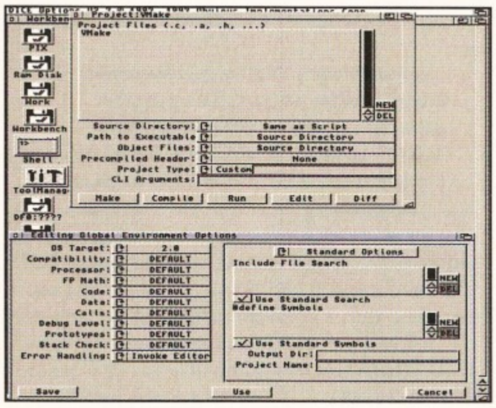
If your disk absolutely refuses to work and you are certain it is faulty, please return it, along with an SAE, to:

Amiga Shopper Coverdisk
(insert the name of the disk)
Discopy Labs Ltd
PO Box 21
Daventry
NN11 5BU

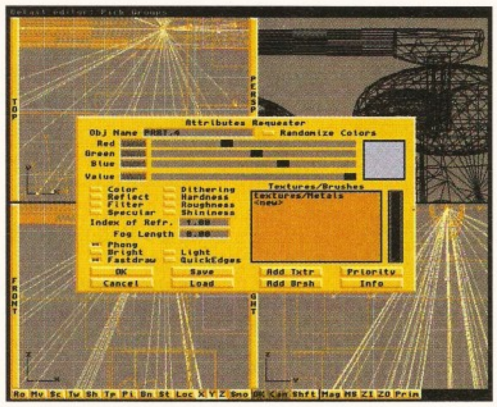


Disk instructions

Got two disks? Unsure of what to do with them? **Graeme Sandiford** *helps you to get all of the programs up and running and shows you how to get the most out of the other files.*

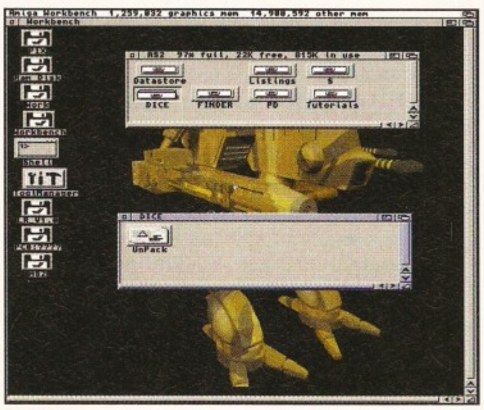


Coverdisk 1 contains a very special version of DICE 3...



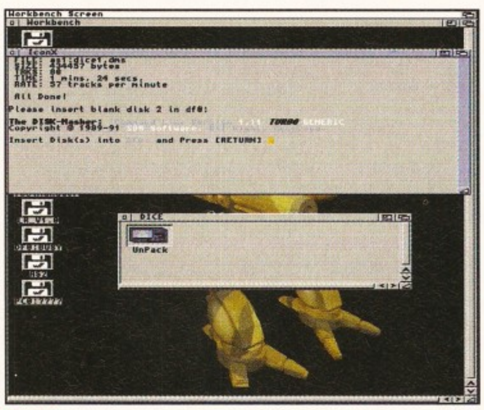
...and there is still oodles of useful files and programs on Coverdisk 2.

Step-by-step to Dice



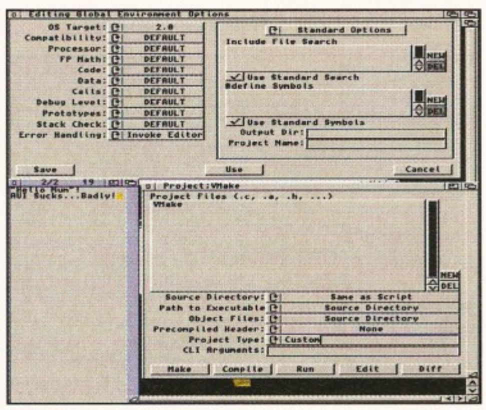
1 ***This month's Coverdisk 1 contains a special version of DICE 3.0. When unpacked, this package fills three whole disks. It was compressed with DMS, so if you are one of those big-head-know-it-all types you might want to skip these instructions and just un-DMS them. But if you are not omniscient, you might consider following these five easy steps.***

First off, you'll need two floppy drives to decompress the disks. You will also need three blank disks – no need to format them. Next, if you are using Wb 2 or above, go to Coverdisk 2, enter the DICE directory and then double-click on the unpack icon. If you are still using WB 1.3, then go to step 4.



2 ***Double-clicking the unpack icon executes a script that has been written to create the three floppy disks you will need to run DICE. This way we save you from too much work. However, although it is quite a simple task, I'll give you a few hints before we begin – to help reduce the possibility of losing wanted data.***

Although you'll receive prompts from the output window, make sure you only place blank disks in DF0:. Do all your other disk-swapping, such as with the Coverdisks, in drive DF1:. With this in mind, simply press <y><return>, insert the first blank disk in DF0: and then follow the on-screen prompts – changing disks as instructed.



3 ***After the third disk has been written, the window should close automatically and you should have three disks called DICE1, DICE2 and 3. DICE1 is your bootup disk, DICE2 contains the Includes and Libraries and DICE3 the docs. At this stage, to run the program just double-click the appropriate icon.***

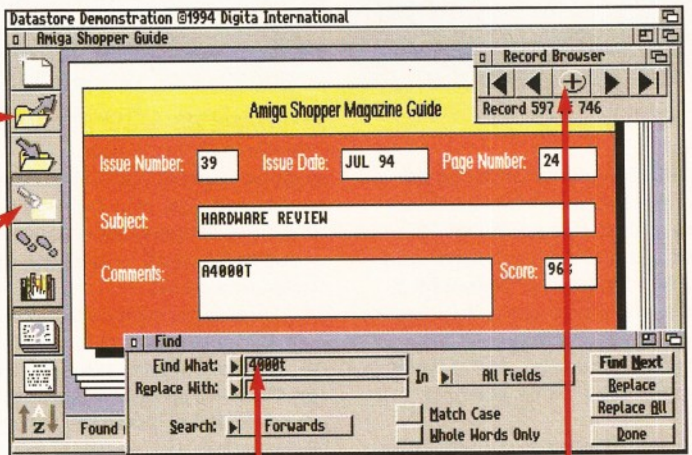
If you don't intend to use DICE from a hard disk, then this is where we part company. If you do have a hard drive, then it's a good idea to run the HD installation script – found on the root directory of the DICE3 disk. Follow the instructions and make sure you have at least 2Mb of hard disk space available. Now run the program and turn to page 6.

Datastore files

f you are a regular reader of our sister magazine, Amiga Format, then two weeks go you no doubt jumped up and down with oy, shouting hurrah! at the top of your voice. Why? Because issue 68 of said mag had a working demo of Digita's brand-new atabase – Datastore.

It's quite a package and you probably had lenty of fun searching through the Amiga Format database. So, we thought that you would enjoy rifling through the contents of our fab magazine even more. On our second Coverdisk, in a directory called Datastore, you'll find a complete guide to every issue of Amiga Shopper since its launch. Yep, that's *46 issues* of the best in serious hardware and software reviews, as well as lots of features. Here's a quick run-through on how to achieve complete enlightenment .

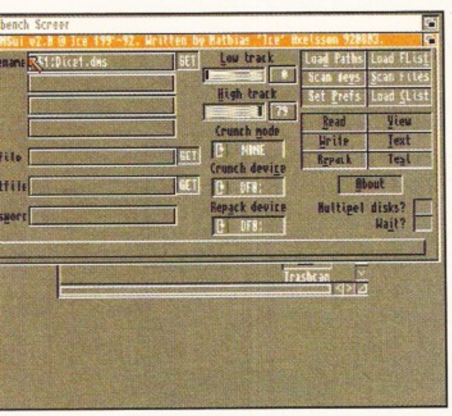
Use this button to open up a database from disk. Choose volume AS2: and open the Datastore directory. Double-click the file inside.

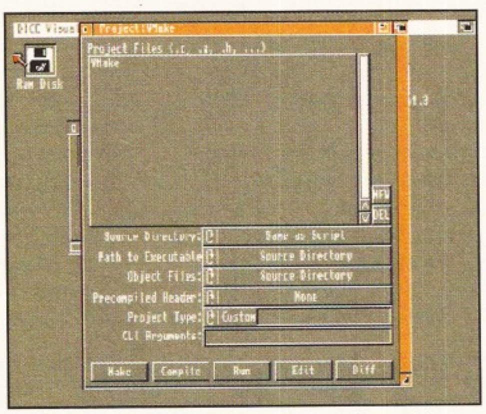


Clicking on this button will bring up the search window.

To find a particular review or feature in Amiga Shopper's issues of yesteryear, simply enter a keyword.

The Record Browser can be used to move through records too.





***4** First open a CLI window – follow step one of the disk backing up instructions you are not sure how. Next copy DMS to the directory of your boot disk by typing the llowing line:*

py AS2:c/dms to C:

ow go to the PD directory on AS2: and run MSui. You can now unpack the disks by lecting the files DICE1.dms, DICE2.dms and CE3.dms, in turn, and unpacking them. You ll not be able to boot correctly with DICE, always boot from your usual disk.

Rename DICE1 to "DCC". If you are ing to run DICE from a hard disk don't name it – just double-click the HD Install ript on disk 3.

***5** I assume that, as you are still reading, you are either nosy or have encountered a problem. If you're just nosy, go do something else. If you've got a problem, such as not having enough room on your Workbench disk to copy DMS or can't run DMSui, then read on.*

We're going to have to unpack the disk manually – yuck! Just type the following lines, exactly, pressing return after each one and swap disks as requested.

```
AS2:c/dms write AS1:dice1
AS2:c/dms write AS1:dice2
AS2:c/dms write AS1:dice3
```

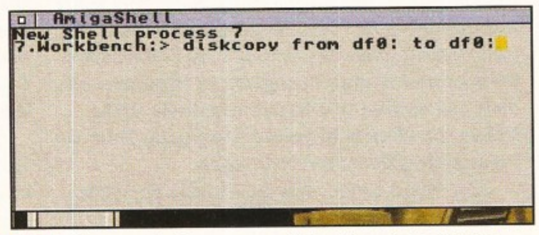
Now follow the final instructions from step 4 and turn to page 6.

Back up that disk

Before using either of this month's Coverdisks, please be sure to back them up – just in case. Simply follow the easy instructions below if you are not sure how to do this.



***1** Boot up from your Workbench disk or partition, double-click on your Shell icon – to be found in your system drawer.*

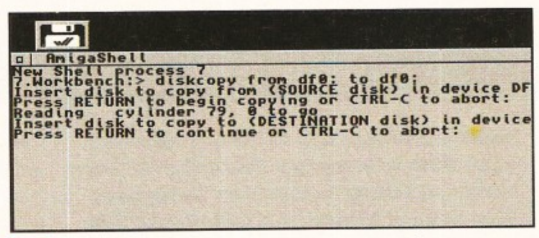


***2** If you only have one disk drive, type in the following line and then press return.*

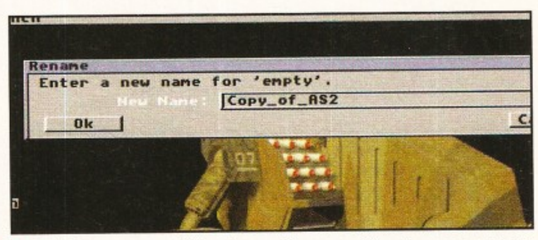
Diskcopy from DF0: to DF0:

If you have two drives, place the Coverdisk in DF0: and a blank in DF1:, then type in the next line instead.

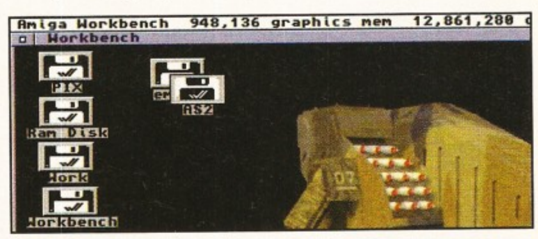
Diskcopy from DF0: to DF1:



***3** Follow the on-screen prompts and remember that the Coverdisk is the source disk and the blank is the destination.*

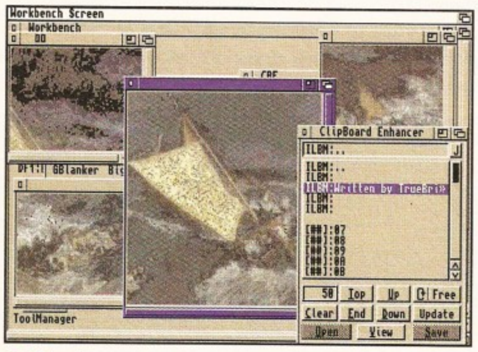


***4** If you used the two-drive method, remember to rename the copy by clicking on its icon and pressing right-Amiga <r>.*



***5** If you have two drives, you can also copy the disk from Workbench by dragging the Coverdisk icon over the destination disk's one.*

PublicDomain



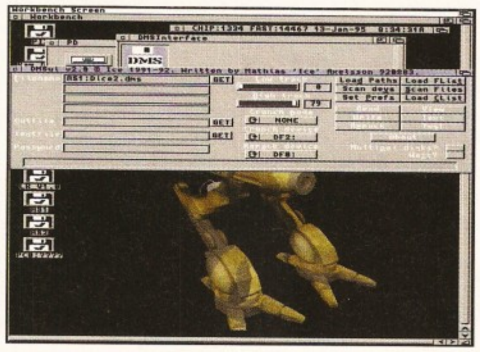
ClipBoard Enhancer

Wb2+ required

CBE is one of the outstanding programs from our definitive top 100 PD programs round-up (starting on page 92). And it's on Coverdisk 2. It's a damned useful program to have around, as it can enable you to cut and paste up to 256 items of data between programs. This can be anything from text to images.

ClipBoard Enhancer is an absolute doddle to install, simply copy it to any directory of your choosing and then double-click its icon. There is no need to copy any libraries or fonts. If you intend to use the CBE regularly, obviously the best place to copy it to is your WbStartup drawer, so that it will be run each time you boot up.

For more information, check out the guide file in the CBE directory.



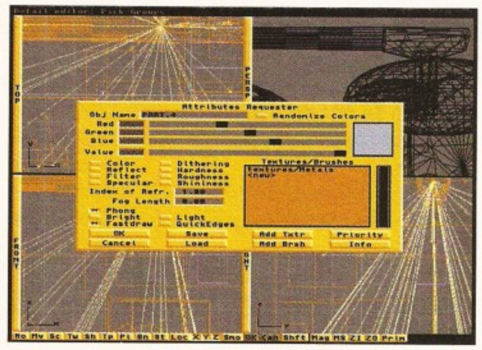
DMSui v2.0

Wb2+ required

DMS, or Disk Masher as it's known to its friends, is the most popular disk archiving system for the Amiga. This month's DICE Coverdisk was squashed down to size using this program. And it's also on Coverdisk 2.

However it can be difficult to use if you are not well acquainted with CLI. DMSui serves as a Workbench interface that can be used to 'mash' or 'un-mash' disks with just a few clicks of your mouse-button.

The first thing you need to do is copy DMS from Coverdisk 2's C: directory to your boot device's C: directory. Run DMSui, select the file you want to 'un-mash' by clicking on the filename GET button, select the output device, insert the output disk and press the Write button.



Imagine attribute files

Imagine 2 or 3 required

Imagine is pretty good at emulating 'real-world' materials. You can give an object just about any attribute you choose – you can turn a lead ball to gold, crystal, air, fog, glass, a mirror, and so on.

However you will have to be prepared to do a considerable amount of experimenting to get the attribute you want, unless you are some sort of physics genius. For example, what's refractive index of human flesh? You don't know? Neither do I!

Thankfully, someone does and they have generously decided to release loads and loads of attribute files into the Public Domain. So all you have to do is load them in. Ah, this goes some way to restoring my faith in human nature.

ShopperTutorials

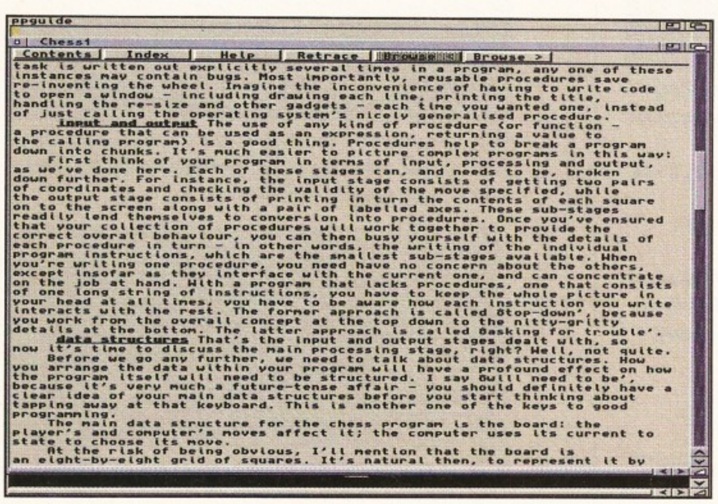
There is one sure way to tell a programmer apart from ordinary folk. He or she will have short and stubby fingers from typing page after page of listings. In an attempt to help programmers pass as normal humans, we are putting the listings from our tutorials on to our second Coverdisk.

Every month, we will be putting the listings of our tutorials into a directory called Listings on Coverdisk 2. Most of the listings will be saved in the ASCII file format, so you can load them straight into your compiler or interpreter with the minimum of adjustments. AMOS files will be provided in their native format and can therefore be loaded straight in.

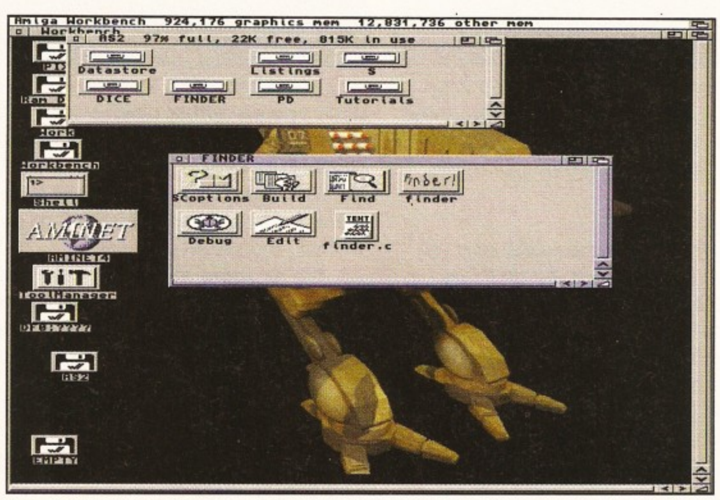
As this month's Chess tutorial is the final instalment in the series, we have provided an AmigaGuide formatted document that contains the previous text and listings, just in case you've missed the previous issues. It's in the Chess directory inside the Tutorials directory. It has been PowerPacked. This means you may have to copy the powerpacker.library from the LIBS directory to your own.

In the listings directory you'll find the listings in both ASCII and AMOS formats. There is also an executable version of the finished program for you to match wits with.

Followers of Toby Simpson's Assembler tutorials (see page 84) will find this month's listings in the Assembler directory. The files mentioned in this month's C tutorial (page 86) can be found in a folder called Finder in the root directory of disk 2.



Experience the joys of multimedia and chess simultaneously.



The Finder directory contains the files for Toby Simpson's C series.

Next Day **£5.00**
2-3 Days **£2.50** Saturday **£10.00**
Deliveries are subject to stock availability

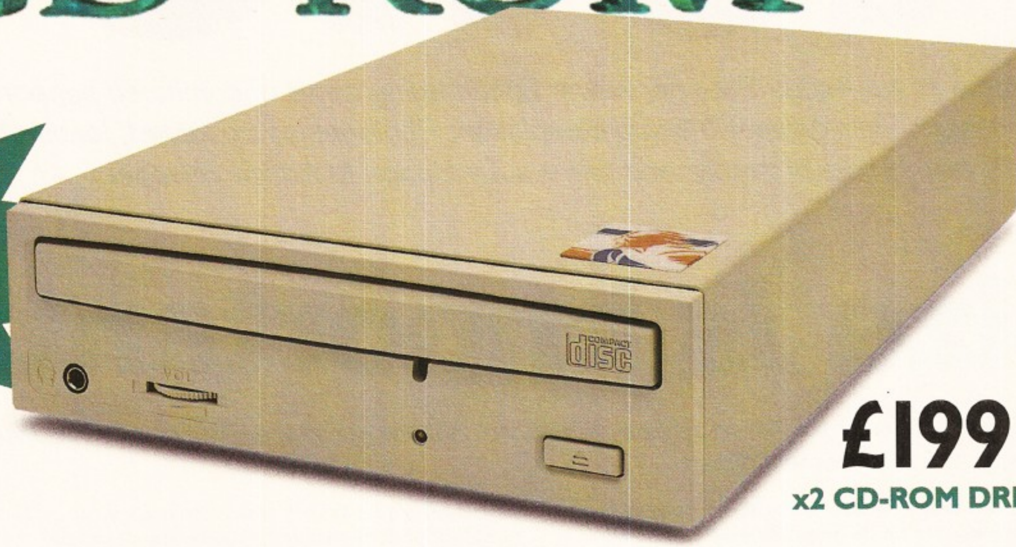
POWER

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CD-ROM

NEW
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EMULATION

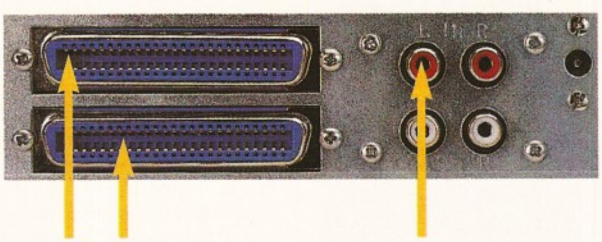


£199
x2 CD-ROM DRIVE

DOUBLE SPEED CD-ROM

The new double speed Power CD-ROM for the Amiga 600/1200 plugs directly into the PCMCIA port and provides a direct SCSI-I and SCSI-II interface, allowing up to six additional peripherals to be connected, for example: Syquest Drives, Hard Drives, Flatbed Scanners and Dat Drives. What's more the Power CD-ROM features a 'Hot-Plug' and 'Un-Plug', which allows you to connect/disconnect at any time the Power CD-ROM and any additional devices, even when your Amiga is switched on.

REAR VIEW



The CD-ROM comes complete with PSU, manual and a useful range of software utilities: Audio CD, CD32 Emulation, MPEG Film Decoder and PhotoCD software.

COMPARISON CHART

	POWER	OTHER
DOUBLE SPEED, MULTI SESSION	✔	✔
MAX TRANSFER (INTERFACE)	3MB	1.5MB
CD32 EMULATION	✔	✔
NUMBER OF SUPPORTABLE DEVICES	7	1 OR 2
THRU PORT FOR ADDITIONAL DEVICES	✔	-
HIGH QUALITY METAL CASING	✔	-
FULLY SUPPORTS 'HOT UN-PLUG'	✔	-
AUTOMATIC BOOTING OF CD-ROMS	✔	-
CD + AMIGA SOUND MIXING FACILITIES	✔	✔
COMPATIBLE WITH ACCELERATOR CARDS	✔	?
12 MONTHS WARRANTY	✔	✔
COMPLETE WITH UTILITY SOFTWARE	✔	-
COST	£199	£199

Prices for Amiga 600/1200

Double - Speed
CD-ROM £199

Quad - Speed
CD-ROM £299

Amiga 4000 Version
CD-ROM ....£POA

80 WATT
SPEAKERS
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News

This month in the Amiga Shopper news: Encouraging news of continued support for the Amiga; LightWave 4.0 nears completion; Photogenics upgraded; loads of essential new products to buy; and win a subscription to Amiga Shopper...

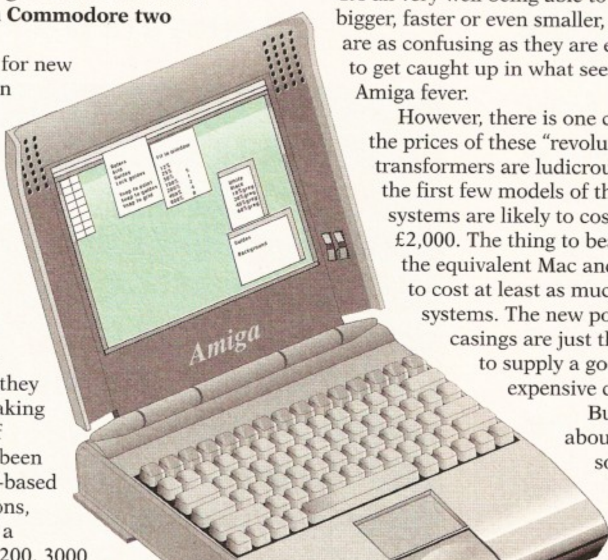
Size *is* important!

Commodore's plans for the Amiga may be on hold, but that has not stopped dedicated developers from giving Amiga-users more choice.

No, this is not another story about Commodore speculating on the possible outcome of the legal battle being fought in the Bahamas. In fact, we will only mention Commodore two more times here.

While Commodore's plans for new Amiga models have been put on the back-burner, it seems that Amiga developers have not been idle. As you look through this issue you'll notice that there are several new developments that have the potential to change the way you will use your Amiga.

The most notable of these are Ramiga's new Z5 and Z7 "tower" systems (see our cover feature on page 20). But while they have been concentrating on making your machine a larger vessel of computing power, others have been trying to make it smaller. A US-based company, Silent Paw Productions, has almost completed work on a portable housing for the 600, 1200, 3000 and 4000 models of the Amiga.



On these news pages you'll find yet another new way to use your Amiga and enhance its performance. There's the new Alpha-based systems now being stocked by Premiere Vision – not to mention the Rendersaurus, both of which can boost your machine's performance up to supercomputer levels.

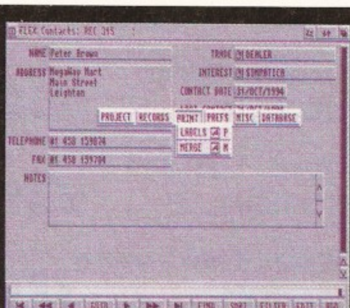
It's all very well being able to make your Amiga bigger, faster or even smaller, but these developments are as confusing as they are exciting. It's all too easy to get caught up in what seems to be a change-your-Amiga fever.

However, there is one certainty, the majority of the prices of these "revolutionary" Amiga-transformers are ludicrously high. For example the first few models of the portable Amiga systems are likely to cost between £900 and £2,000. The thing to bear in mind is that while the equivalent Mac and PC systems are going to cost at least as much, they are complete systems. The new portable and "tower" casings are just that – casings. You have to supply a good deal of the most expensive components.

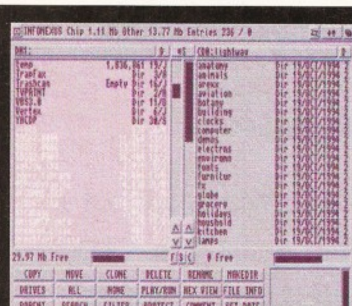
But let's not get negative about this. It does say something on the behalf of Amiga developers worldwide, they are imaginative, loyal and most importantly, relatively independent of Commodore. And once the dust, and the prices, settle there are going to be some exciting products available. ■

Information Nexus

Optonica are set to release two new utility programs, InfoNexus and DataNexus. InfoNexus is a file manager that Optonica hope will prove to be a Directory Opus-beater. One of InfoNexus' strong points is it's simplicity – there are no fiddly features to set up – you can run straight from floppy. DataNexus is a flat file database program that can store text, images and sounds. Both products cost £29.95 each and are available from Optonica by calling ☎ 01455 558282.



This is DataNexus in action – it's a new database from Optonica.



InfoNexus is a new file manager from the same stable.

Titbits

Creek get on-line

One of the world's leading CD-ROM manufacturing companies, Walnut Creek, now have an Internet site that you can visit. Their World Wide Web address is //code// FTP://FTP.CDROM.COM //end code// and contains news of their new products and a complete listing of all of their CD-ROMs. You can also send E-mail orders and enquiries to CDROM.com.

Iiyama launch new monitor

Iiyama are the corporation that produce the IDEK range of monitors. They have now dropped the IDEK name in favour of its global identity. IDEK monitors are regarded as top-of-the-range, expensive models, but their new monitor, the Vision Master MF-8115, will be retailing in the UK for only £329.

The MF-8115 is a 15-inch monitor with a dot pitch of 0.28, anti glare and static coated. For more information about this new monitor and others in the Vision Master range call Iiyama UK on ☎ 01438 745482.

Prof says games are good

According to Professor Stephen Heppell, head of Anglia Polytechnic University's learning technology centre, computer and video games can have a strong, positive influence on a child's development. Apparently, the approach necessary to complete certain games is similar to ones that can be applied equally well to class tasks set at school. "In both cases it is a process of observe, question, hypothesise and test".

However, parents are urged to get involved too. This will help keep computer activities from being anti-social. It will also allow parents to guide their children's choice in software.

Virtual traffic jams?

AA Roadwatch and Compuserve are working together to supply Compuserve subscribers with real-time traffic reports. The traffic reports will be grouped under several headings such as "Motorways" and "Public Transport" and then divided into geographic areas.

To find out more about this and other services offered by Compuserve call them on ☎ 0800 289378.

Oops!

Apologies to Fourth Level Developments for printing their fax number on page 4 of issue 45 instead of their phone number. Fourth Level Developments' phone number is: ☎ 0117 955 8225.

KX-P2135

New from Panasonic is the KX-P2135 Quietprinter which gives 360x360dpi sharp colour printing and includes 7 colour printing, a set-up disc with Windows 3.1 driver and a 20-sheet cut sheet feeder. And very quiet it is too, with an operating noise level of only 43.5 dBA in super-quiet mode.
The printer costs £189 (ex VAT). Call Freephone Panasonic on ☎ 0500 404041 for more information.

New multimedia bureau

Optonica now offer all creative, development and marketing organisations their Multimedia Services Bureau. The services covered include 3D graphic design, consultancy, voice overs, audio sampling, DTP and client liaison amongst a host of other things – too many to list here. For more information about the Bureau contact Lee Gibson on ☎ 01455 558282.

Almathera upgrade

All registered Photogenics users can now get hold of a free 1.1a upgrade to their Photogenics package. The upgrade includes lots of new features such as any-angle rotation from 0 to 356 degrees. Simply send a 3.5 inch disk, a stamped addressed envelope disk mailer and your registration number to Almathera, Boundary Business Centre, 92-94 Church Road, Mitcham CR4 3TD

Datasets galore

Viewpoint Datalabs International have a new dataset catalogue and have opened a UK office. They will also soon be producing a CD-ROM.

The company specialise in the production of high-quality 3D models. These can be built to your specifications; pivot axis, morph targets surfaces and levels of detail can all be produced according to your need. The objects can be delivered in almost any 3D format, including LightWave, Real 3D, DXF and Imagine.

If you would like to find out more about the services they have to offer call them on ☎ 01784 451815.

A Class act

Italian firm, ClassX, is set to make waves in the Amiga video market with two new products. First up is Power Titler, a revised update of the original X-Titler which, although given great reviews, was never distributed in the UK. The new version is faster, has more features and will run on virtually every Amiga.

The second product is X-DVE, which is a Digital Video Effects program. X-DVE can combine text, images and animations to a maximum length of 10,000 frames.

Neither of these products are available in the UK yet, but hopefully that situation will have changed by the time we review them.

Networking bonanza

Intangible Assets Manufacturing (IAM) have recently updated their exceedingly popular networking software – Envoy. Envoy 2.0 has undergone some refinements and gained several new features.

Envoy now has support for removable media, AmigaGuide documentation and Workbench 2.04 DOS data packets. It also has improved reliability and more robust recovery, so there should be less of a reason for tears when your machine crashes.

IAM are also working on a new budget-priced peer-to-peer networking system called Sneakernet.. It should be ready in April, and will cost just $15 (approx. £9). That will cover both the hardware and software, which comes on a single floppy. It is intended to be easy to use and install and has an unlimited site-license.

To find out more about either of these two products call IAM on ☎ 0101 610 853 4406. Alternatively E-mail them on info@iam.com or even visit their Web site – http://www.iam.com/iam.

In the works

Exciting things are happening in the NewTek camp, as LightWave 4.0 nears completion. The finished versions for both the Amiga and PC should be appearing, both in the US and Europe, between now and March, and it is going to have some very impressive new features indeed.

Although LightWave's interface will retain a familiar format, there will plenty of tweaks in response to requests from users.

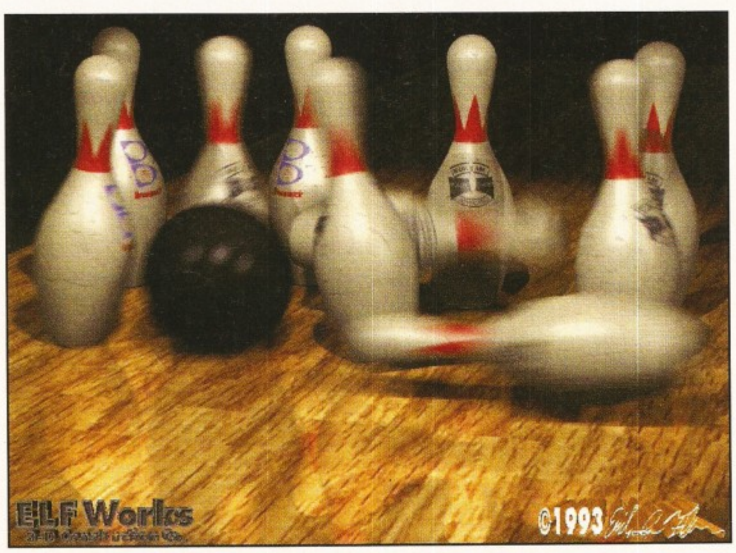
While previous versions of LightWave have had to rely heavily on AREXX to accommodate new add-ons, LightWave 4.0 will be based on an open architecture. Plug-ins can be added by NewTek or third parties in much the same way as IPAS modules are produced for 3D Studio. These plug-in modules can be anything from object and image converters to complete environments for things such as collision detection and particle systems.

Several third-party developers are already working on plug-ins. Inova Design are developing a module that will enable you to output to their excellent ImageFX image processing package, so that images will be rendered complete with the program's filters.

One of the most promising of the new built-in features is inverse kinematics. This feature can be used to produce realistic motions easily and in a natural manner and it will be augmented with improvements to LightWave's hierarchical functions.

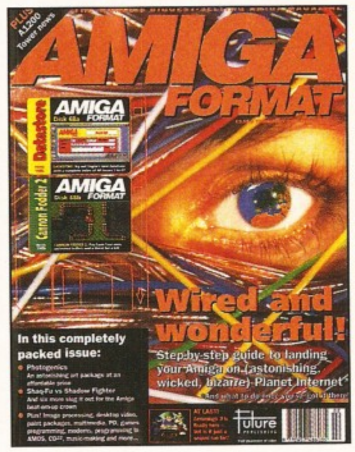
This will be particularly useful to people who are involved with character-based animations, such as games developers.

In an effort to create a "level playing-field" for all platforms, NewTek will make data, such as objects and scenes, cross-platform compatible. They will also be providing an upgrade offer from the Amiga version to any other one for just $149. So if you come into any money and buy an SGI you won't have to fork out 20 grand on a decent 3D animation package. ■



Strike! LightWave 4.0 is going to have some amazing features.

Meet our sisters

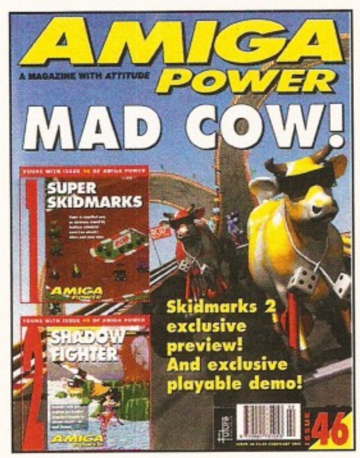


Take that!

Greetings! It is my mission to tell you in 100 words or less what is going on in the world of Amiga Format, that cornerstone of Amiganess. You know it's futile, I know it's futile. How could anyone possibly sum up the entire contents, the great Datastore Coverdisk (which you need to access your Amiga Shopper database), the excellent Cannon Fodder 2 demo, not to mention the definitive and complete guide to the Amiga Internet scene in such a short space? Then there are all those features, the full review of Photogenics, a scoop on Personal Paint 6.1 and Mr McGill's wise words on the Videopilot system.

Well, that proves it. I have exceeded my allotted space already, and I haven't even mentioned the modem round-up, Pagestream update, rendering tutorial...

Nick Veitch, Editor, Amiga Format.

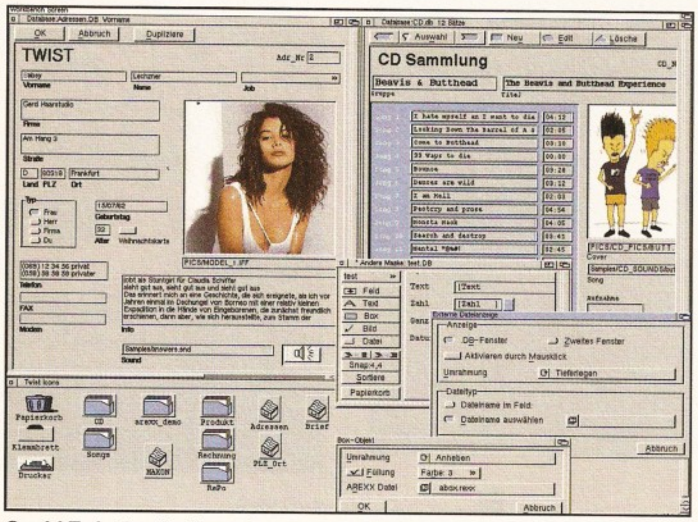


And that!

February's Amiga Power has an excellent cover featuring cows on wheels (rendered on an A4000 running Super ModelPro 2.3 or something, probably). (Although, frankly, we've no idea.) It's a reference to the great-looking Skidmarks 2, which is previewed inside along with The Hidden's new Formula 1 game, TBE. The magazine is also packed with our famed reviews, and comes with two Coverdisks featuring demos of Shadow Fighter (a fantastic beat-'em-up) and Skidmarks 2. And our guide to MultiMedia packs more ESSENTIAL INFORMATION into two pages than most magazines DISSEMINATE in a lifetime.

Jonathan Davies, Editor, Amiga Power.

15



Could Twist be the best database of the year?

Twist and shout

Twist is a brand new relational Database which shows a great deal of promise. It is available from HiSoft for £99.95, who can be contacted on ☎ 01525 718181.

One of the best things about this new package is its beautiful and easy-to-use interface. It's a simple matter to move from record to record or from database to database. Another praise-worthy feature is its blistering speed. I had a play around with a copy and a database with over 1,000 entries. When performing searches, the program tore through the data with ridiculous speed.

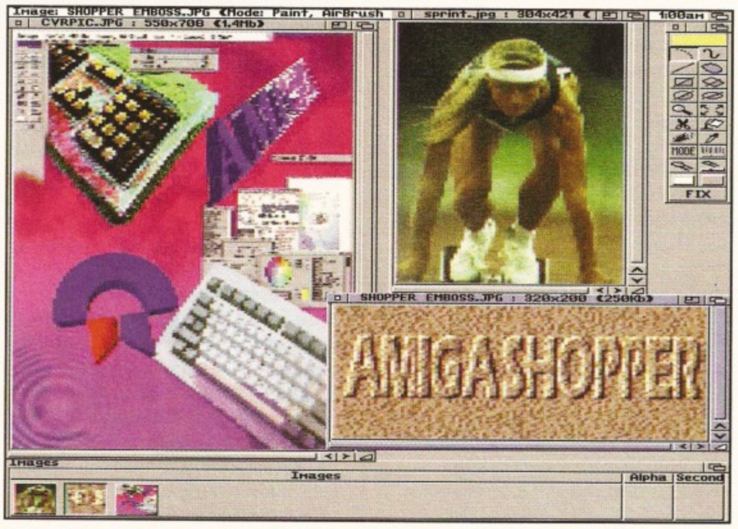
Another of Twist's excellent features is its support for DataTypes. This not only means that you can incorporate images in your entries, but also sounds, music and even animation.

Photogenics upgraded

Yes, Photogenics has been upgraded already! This Amiga Shopper Star Buy, reviewed in issue 46, 24-bit combined paint and image processing package now has several new features.

Existing users of this brilliant package can upgrade to the latest version free of charge. All you need to do is send Almathera a blank disk and a stamped addressed disk mailer, along with your registration number. And post it to: Almathera, Southerton House, Boundary Court, 92-94 Church Rd, Mitcham CR4 3TD.

So what's new? First up is an increase in speed – operations such as blurs and other filters are faster. There are new Stellate and Refract painting modes, Median and Defocus filters, any-angle rotation and support for loading and saving 32-bit Targa files. If you haven't got a copy of one of the best packages of the year, you can buy it for £54.95. ■



It's only been two months, but Photogenics has already been upgraded.



The SpeedCom+BF can handle both V.Fast and V34.

Best of both worlds

Normally 28,800 modems either have support for the V.Fast or V34 protocols, but the SpeedCom+BF can handle both of these high-speed formats. It costs £199.99 and is available from Siren Software, ☎ 0161 796 5279.

Other features include:

- Support for fax classes 1, 2 and group 3
- Full duplex at 28.8
- CCITT V.42bis and MNP 5 data compression
- CCITT V.1.7, hardware and software flow control
- 12 month warranty.

There is also a customer support line set up for information, etc.

Pegger 2.0

Version 2.0 of Heifner Communication's innovative graphic file compression system, Pegger, is now available in the UK. Ramiga International, ☎ 01690 770304, are supplying Pegger 2.0 for £59.95.

If you are not familiar with Pegger it's a system that can be used to create JPEG format images from non-JPEG supporting applications. The JPEG image format is highly-compressed and widely supported, although a few packages still don't have full support (such as LightWave, Brilliance and Deluxe Paint).

However Pegger is more than a simple conversion program. It can be set up to snoop on specific programs. In this way programs can automatically convert images to and from the JPEG format. Version 2.0 is twice as fast and has AREXX-support. You can also batch convert a directory of images and drag-and-drop files from Workbench.

You'll need at least 2Mb of RAM, a hard disk and Workbench 2 or greater.



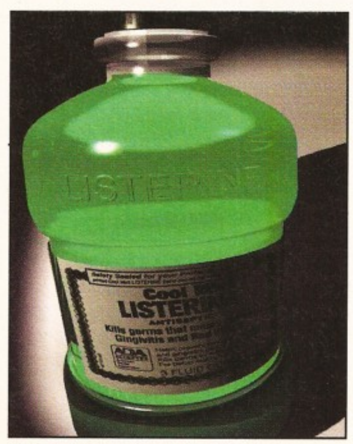
Create JPEG format images with Pegger 2.0.

Rendersaurus

Yep that's right, there's more prehistoric LightWave shenanigans going on. First there was the Raptor, and now here comes the Rendersaurus. This latest LightWave-compatible rendering station will cost between £4,000 and £7,000.

A UK distributor is in the pipeline, but in the meantime Rendersaurus is being stocked in the USA by Anti Gravity Products, who can be contacted on ☎ 0101 310 393 6650.

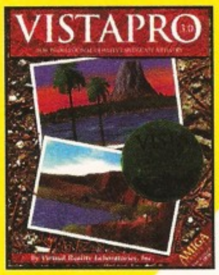
The Rendersaurus is based on the same RISC technology as the Raptor and promises similar performances. In fact it works in the same way too – through an Ethernet cable.



The Rendersaurus is another high-powered rendering-engine.

19

Emerald Creative Technology

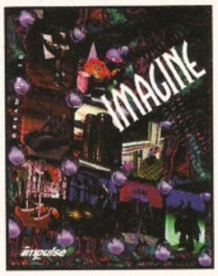


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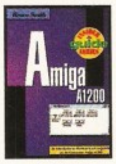



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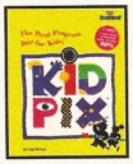

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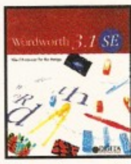
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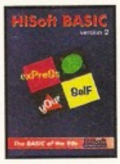
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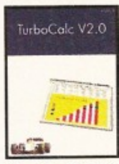
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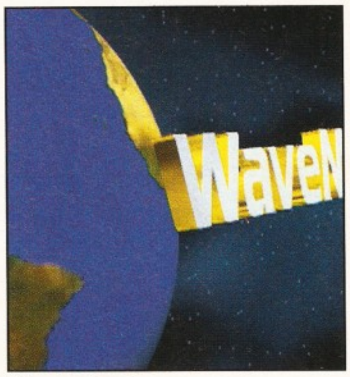
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Making waves

Premier Vision ☎ 0171 721 7050 are stocking the latest version of Wavemaker for £129. Wavemaker 2.0 has plenty of new features and new motions. Wavemaker is an excellent animation tool for LightWave-users. It has loads of preset motions and wipes built-in. It also has several prefabricated scenes that have been created by professional animators. Animations can be rendered from within WaveMaker or can be loaded into LightWave and adjusted. Version 2.0 now has built-in links for DPS' excellent PAR card.

Multilayer is a brand new tool for users of ImageFX and ADPro. It's a layering and composition tool for video and graphics work. It costs £99 and gives you control over image mapping, luminance and chroma-keying and can handle image resolutions up to 4,000x4,000 pixels.



Wavemaker has even more features for animators.

Even more rendering power

It appears that the arrival of the Raptor has sparked off a rendering engine craze, Premier Vision are now stocking a whole new range of LightWave rendering engines. The range starts £4,500 and rises to £7,499.

The baby of the range is the Warthog, which runs off a 166Mhz DEC Alpha processor. It's supplied with 16Mb of RAM as standard, a 1Gb SCSI 2 hard drive and a CD-ROM drive. It has its own 17-inch monitor and is delivered in a tower case. The Warthog costs £4,500.

Next up, in terms of price and power, is the more majestically named Firebird, which is available for £6,800. It uses an even beefier processor, the 233Mhz version of the DEC Alpha. It's also supplied with twice the amount of RAM (32Mb). The Firebird also comes with the same monitor, hard disk casing and CD-ROM drive.

The Warbird is the other rendering station in the range and is similarly specified to the Firebird. Believe it or not, but it has an even faster version of the DEC Alpha – 275Mhz.

All of these systems come complete with mice, Ethernet cards, 4Mb video cards and full technical support. To find out more about this monstrously powerful trio call Premier Vision on ☎ 0171 721 7050.



Premier Vision have a new range of LightWave rendering stations.



The Panasonic KX-P2135 is ideal for a small business.

Affordable colour-printing

Panasonic have produced a new budget-priced colour 24-pin printer. The KX-P2135 QuietPrinter will only cost around £150 and yet it will print in colour with a maximum resolution of 360x360 dpi (dots per inch). At that price it's aimed directly at small businesses and home-users.

This 80-column printer will come complete with a 20-sheet feeder and 10 internal fonts. It has a maximum speed of 250cps (characters per second) and a special super-quiet printing mode.

It can quite happily emulate the Epson LQ-860 and the IBM ProPrinter X24E. It also has a relatively small footprint as it only measures 434x314x147mm.

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All you have to do to be in with a chance of winning one of those five subscriptions is answer the five questions on the right. Write your answers on a postcard and send it to:

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Hint: You'll find the answers to all the questions below within the pages of this issue of Amiga Shopper. So make sure you read it from cover to cover, some of the answers are well hidden.

The closing date for this competition is Tuesday, 7th March. The first five names out of the sack after that date will win the five subscriptions to Amiga Shopper.

The questions

1. Who publishes the fractal scenery generating program called Scenery Animator?
2. What did Mojo enjoy building when he was young?
3. On which page of this issue of Amiga Shopper does a picture of Tutankhamun appear?
4. How much money can you save when you buy a copy of DICE 3.01 from Amiga Shopper Mail Order?
5. What does the acronym TCP stand for?




RAMIGA
Z5
Commodore
1942
AMIGA

Towering achievement

Running out of space in your A1200? ***Richard Baguley*** *investigates an innovative new product which will add Zorro slots to your A1200.*

The A1200 is an absolutely stonking machine, but sometimes it's just not enough. For instance, there are no 24-bit graphics cards for the A1200 and the expansion possibilities are limited, to say the least. Stick in a RAM card, or accelerator, and you've used the main expansion slot on your machine. Although you can fit some peripherals to the PCMCIA slot, your options are rather limited.

Fortunately, there is an alternative. The Ramiga Z5 is a new device from the Welsh Amiga Centre of Excellence which claims to take a standard A1200 and give it five Zorro III slots, the same number as the Amiga 4000. So, is this really the thing to turn your lowly A1200 into a new machine?

The idea is simple – take out the motherboard of your A1200, fit it inside a new case, add on a couple of new PCBs and you're off. For the specifics of this process, see the box on page 26 headed "Fitting it".

The heart of the Z5 is two new Printed Circuit Boards. The first (and smallest) of these fits on to the motherboard at the expansion slot. This has a couple of connectors for the second board, as well as a pass-through, so you can still fit a standard A1200 expansion card, such as an accelerator or RAM card. I did have some difficulty running with some cards, so I would suggest that you check the compatibility with Ramiga before upgrading your A1200 with a Z5.

I was also a little concerned that the CPU on some cards was a little bit close to the case, and the ventilation may not be enough to keep some CPUs cool. As some accelerators do tend to get rather hot, this could be a bit of a problem.

The second card fits on to the first, and it is this which contains the Zorro slots, as well as a real-time clock. It sounds odd, but it seems to work pretty well. All of the slots are Zorro II types. I tested it with a variety of Zorro cards (including a Tandem CD-ROM controller, a Oktagon SCSI interface and an EGS graphics card), and all of them worked fine.

However, you should remember that cards which are Zorro III only (such as the A4091 SCSI card and the Rainbow III graphics card) will not work in this unit. Fortunately, many cards which are designed to work in a Zorro III slot have a Zorro II fall-back mode, so you can still use many of them (such as the GVP EGS Spectrum 24-bit graphics card), as they will automatically detect what sort of slot they are in and work accordingly. However, you should check that the card you want to use in the Z5 does this before purchase.

Actually, fitting Zorro slots to the A1200 is not that difficult, as the expansion port is basically a modified Zorro slot. All that is needed are a few addressing Chips and neither of the boards are particularly complex, with a pretty low Chip count. For some reason all of the Chips on the review model were unmarked, so we could not tell what they did.

As far as keyboards go, you have two alternatives: you can either use the A1200 one, or a PC keyboard. The unit is either supplied with an adaptor which allows you to plug in a standard PC keyboard, or an external case which the A1200 keyboard is fitted into. The Amiga keys are automatically mapped on to other keys.

Case for the prosecution

The case which houses all of this electronic stuff is a fairly standard PC-style mini tower case, as seen housing all manner of large PCs and file servers. The layout of the case betrays its PC origins, but it has been heavily modified to Amigafy it. It certainly seems to be pretty tough, and the sheet steel case should stand up to the slings and arrows of outrageous

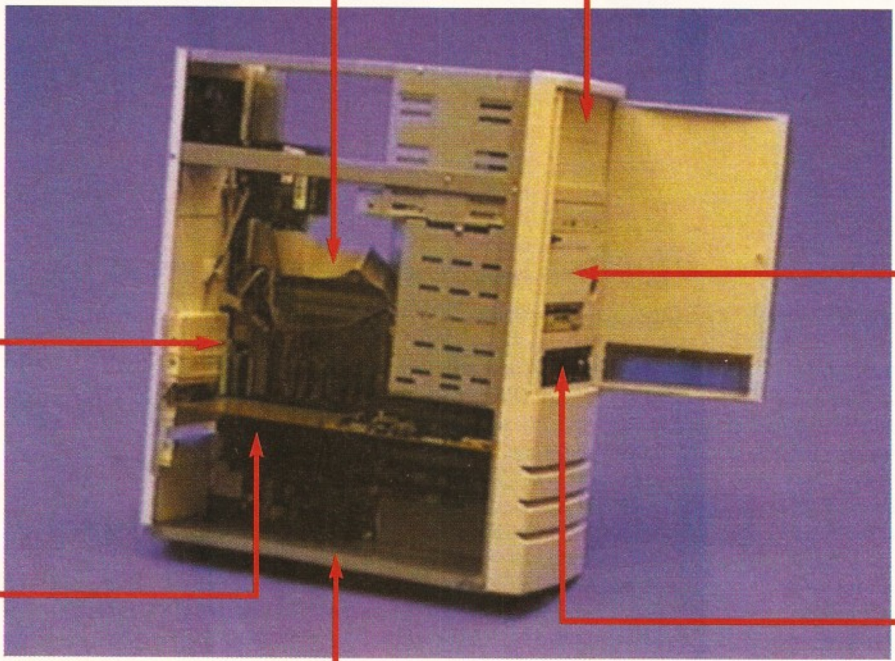
▶ 23

"The idea is simple – take out the motherboard of your 1200, fit it inside a new case, add a couple of PCBs and you're off."

Pic: Jonathan Fisher Photography

Inside information – all about the Z5

The insider's view of the Z5 Tower system. All you have to do is take your A1200 apart and then re-assemble it. Some of the key features of the system are indicated below.



A certain amount of re-cabling, unscrewing and screwing back up is required to safely seat the A1200 motherboard inside the tower.

5.24 inch drive-bays provide a safe haven for hard disks or CD-ROM mechanisms. There is space for at least two.

The backplane conveniently provides an output for all of the standard A1200 sockets, so you can still use your printer, modem, monitor, etc.

The 3.5 inch drive-bays allow for extra floppy drives or smaller hard drive mechanisms.

The expansion system will give you four Zorro II-compatible slots, so you can plug in a wide variety of existing Amiga hardware.

The "turbo" switch can be wired to enable, or disable, an accelerator card, if you have one.

An existing 3.5 inch IDE drive can be safely located at the bottom of the case, unless you have some very long leads.

The mark of Zorro

The main feature which the Z5 adds to the A1200 is the four Zorro II slots. But what is a Zorro slot?

Way back in the mists of time when Commodore were designing the now legendary Amiga 1000, they decided to come up with a new way of connecting peripherals such as hard disk interfaces and graphics cards to the computer.

One possibility was to use the same type of slots as PC-compatible computers, but this was deemed not to be flexible enough, as it was slow and difficult to use.

Instead, the engineers came up with a whole new standard which was, for some reason, called Zorro. This powerful standard was ahead of its time, with very high data transfer rates between the card and the computer.

With the launch of the A2000, the standard was further refined to Zorro II. But it was still not fast enough, as the speed of graphics Chips and hard disks was increasing at an immense rate. So, the engineers went back to the drawing board once again and came up with Zorro III, which was both faster and could cope with larger amounts of memory on expansion boards. Fortunately, it's still possible to maintain backwards compatibility, so you can use a Zorro II card (such as the Tandem CD-ROM and IDE interface) in a Zorro III slot.

However, the story does not end here. Keen-eyed readers may have noticed that all big-box Amigas have two sets of slots. One set is the Zorro slots, but the other is PC/AT-style slots, as found in IBM compatible machines. Some users believe that these allow them to plug in cards designed for PCs and use them as if they were Amiga cards. However, the story is not quite this simple.

These PC-style slots are designed to work with a Commodore card called a Bridgeboard, which fits across both types of slots. This allows you to emulate a PC-compatible computer and the PC-style slots can be used by these cards. However, they cannot be used by the Amiga-side, so there is no simple way of using a PC card in the Amiga, which is a pity, as PC cards are usually cheaper than their Amiga-equivalent.

Second-hand savings?

Let's look at a typical situation; you've got an A1200 fitted with an accelerator and you want to start showing the graphics you are producing in their full 24-bit colour. But, you can't fit a 24-bit card to the A1200, so what do you do? Do you sell your A1200 and buy an A4000, or do you buy a Z5 and fit a 24-bit card to that?

As with any such decision, money is a primary motivation. If one option is much cheaper than the other, then that one would leave you more money to invest in the graphics cards. So let's have a look at a few alternatives, with the help of a few prices from the Amiga Shopper reader ads (page 57).

- 1. Sell the A1200 and buy an A4000. A fairly typical price you would expect to get for your A1200 would be around £650, although prices vary. Buying an A4000/030 would cost you something in the region of £1,000. As new A4000s simply don't exist, the second-hand value of an A4000 is not far below this. So, you would end up paying something in the region of £350, although I should point out that these prices will vary widely.

- 2. Buy a Ramiga Z5. This will cost you £400, or £450 if you buy a power supply as well.

As you can see, there is not that much in it in terms of money. However, it should be pointed out that buying second-hand equipment requires a degree of caution.

21 ▶ treatment. Drop something on to your A1200 and you will quite likely have a problem which will require some serious re-building work. Drop anything short of a wrecking ball on the Z5 and it will just shrug and keep on working.

At the rear of the case are the various sockets for video and the like. Holes have been cut in the case, so there is no need for adaptors and the like. Even the blanking plate for expansions which fit into an accelerator is fitted, so if you have an accelerator such as the GVP A1230+ you can use the optional SCSI interface in the Z5.

The case is not designed to sit *on* a desk, but, instead, to sit by the side of the desk. At the front of the case is a door which covers the front of the drive bays. There is also a LED display which can be configured to show the speed in Megahertz (Mhz) and two buttons marked "Turbo" and "Reset". The display is a three digit job, but the first digit is used to show when disk activity is taking place.

Inside the case there is space for three full-height 5 1/4 inch disks and five half-height 3 1/2 inch units. All of the 5 1/4 inch units have access to the front of the case, but only three of the 3 1/2 inch bays have holes at the front. The two bottom drive bays are behind the panel for the buttons and the clock display. This means that you could have a hard disk located in the bottom drive bay, with the floppy disk drive located in the one above, a Syquest drive in the next one, a tape streamer in the next, etc.

Power to the people

No power-supply is fitted as standard, although this is available as an option. This is a possible cause of concern; the A1200 power-supply is not really beefy enough to cope with the demands of power-hungry expansion cards, and it certainly is not designed to power hard disks and the like. If you are planning to add some of that, then you will certainly need to include the cost of a new power-supply. Indeed, the manufacturers recommend that only one card is used if you are still running off the standard A1200 power-supply.

Frankly, I would not recommend this unit to be used without a high capacity power-supply if you are planning serious use with your Amiga, especially if you're already using a power-hungry peripheral, such as an accelerator card.

If you replace the power-supply with a high capacity one (which connects to the busboard) this takes over from the standard power-supply unit, so you can power the entire system from one plug.

One of the big selling points of this unit is that you can continue to use your existing A1200 peripherals, including the hard disk which was originally fitted inside the A1200. Unfortunately, there is no provision for mounting this inside, although a part of the busboard is cut away to allow you to plug a cable into the A1200 motherboard. The only place that I could find to put the 2 1/2 inch drive was in the bottom of the case, which was hardly ideal, especially as this meant that the disk was loose in the case. Call me a traditionalist, but the idea of having an expensive drive knocking around loose in the bottom of the case strikes me as a bit dodgy.

No PCMICA

The other problem is that the expansion case effectively cuts off the PCMCIA port, so you

▶ 25

Have we got a video?

The main difference between the Ramiga Z5 and the A4000 is the lack of a video slot. This slot (which is present in all big-box Amigas) is different from a normal Zorro slot in that all of the video signals present on the video port are also present in this slot.

This is designed to make the process of combining graphics signals produced by the Amiga with the graphics produced by the video card easier. Cards, such as the Video Toaster and OpalVision card, have made use of these signals so that they can only be fitted to an Amiga with a video slot – an A1200 fitted to a Ramiga Z5 can, therefore, not use these cards.

However, this does not mean that you cannot use a 24-bit graphics card in a Z5. Most modern graphics cards (such as the Picasso II, EGS Spectrum and co.) do not use the video slot, but sit in a standard Zorro II or Zorro III slot, so they can be fitted to a Z5 without any problems.

> "One of the big **selling** points of this unit is that you can continue to use your existing A1200 peripherals."

The A4000T

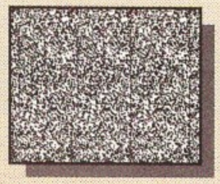
Loyal readers of Amiga Shopper may remember that way back in issue 39 we reviewed the A4000T, a tower model of the popular A4000. Graeme Sandiford described it as "The Mother of all Amigas". This powerful beast was based around a 25Mhz 68040 CPU and a modified A4000 motherboard, which had a built-in SCSI interface for hard disks, tape streamers, etc.

This Amiga also had two video slots, meaning that two graphics cards, such as the Video Toaster and OpalVision cards, could be fitted at the same time. Although it was rather expensive, many Amiga users were looking forward to getting hold of a machine which could hold more peripherals and hard disks than the A4000 could ever cope with. Unfortunately, the A4000T never really got the chance to prove itself in the marketplace. Why not?

Well, the simple truth of the matter is that Commodore went bust. When Commodore International went into liquidation in April 1994, only a very limited number of these machines had been manufactured. Since then, these have been quickly snapped up, so you are very unlikely to see one in your local Amiga shop.

So if Commodore have been sold, is the A4000T likely to make a comeback? I think it's unlikely. What the new owners of the Amiga will need is a machine which is cheap to capitalise on the home market and get some cash back into the company. So, it is likely that the first machine to be built by the new company will be the A1200. It is possible that they will start manufacturing the A4000T, but it will still be an extremely expensive alternative to the A4000 and will, thus, only appeal to the real power-user who makes money out of the Amiga.

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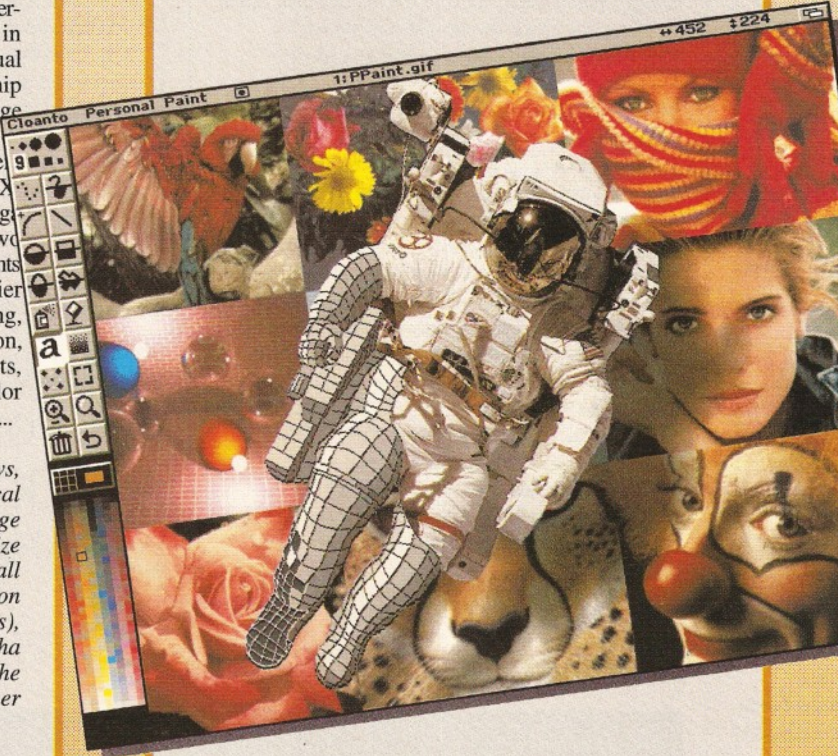
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The large picture shows, among other things, practical applications of Palette Merge and Color Average Resize (used to scale and combine all items), Color Quantization (applied to 24-bit images), Gradient Fill and Alpha Channel (used to create the shadow) and various other image processing effects.

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From the International Press

Animation is fast and effective, particularly because of the innovative storyboard feature.

Virtual memory is fantastic if you don't have enough real memory in your machine.

The image processing tools are bountiful and versatile as always, and the 24 bit printing is again excellent. It certainly pushes printers to their limits, and the results may very well surprise you.

PPaint is unbeatable at handling the palette and in remapping quality.

Font handling on PPaint has always been fantastic. I like the way that you can type directly over the screen and still use the cursor and delete keys for editing, even if you've typed a whole screen full of text.

The alpha channel is simple to use and yet a very powerful feature normally found on expensive 24 bit programs.

Rating: 90%

Gary Fenton, Amiga User International, Great Britain

What do BBS users, C programmers, Bridgeboard users and Amiga artists have in common? Give them all a copy of Personal Paint and you'll find out.

Fred Hurteau, Amiga World, USA

That installer happens to be one of the friendliest and most intelligent I've had the pleasure to se... PostScript output is finally supported by a int program!...

*t's see *** do that!*

ting: 92%

dley Storey III, Amiga Down Under, Australia/NZ

xcellent piece of software: stable, user ndly, fast. It is packed with unique features that make it very precious in many difficult situations: color quantization, palette merge, image processing, PostScript color separation, professional Preferences printing and many more.

Highly recommended, both to novice users, who will take advantage of the excellent documentation and the intuitive user interface, and to experienced professionals of different fields such as graphics, DTP, programming and multimedia.

Editorial, Amiga Magazine, Italy

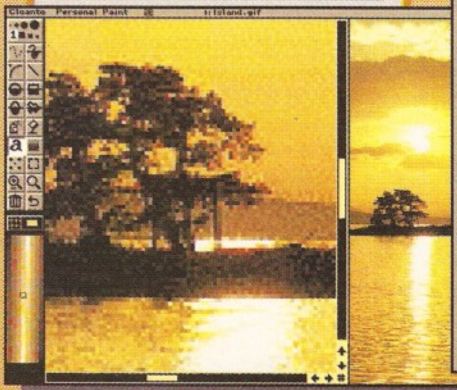
As a professor of plastic arts and counselor at the film institute, I'm always in search of tools which succeed in combining ease of use with a range of original features. My most recent discovery has been Personal Paint.

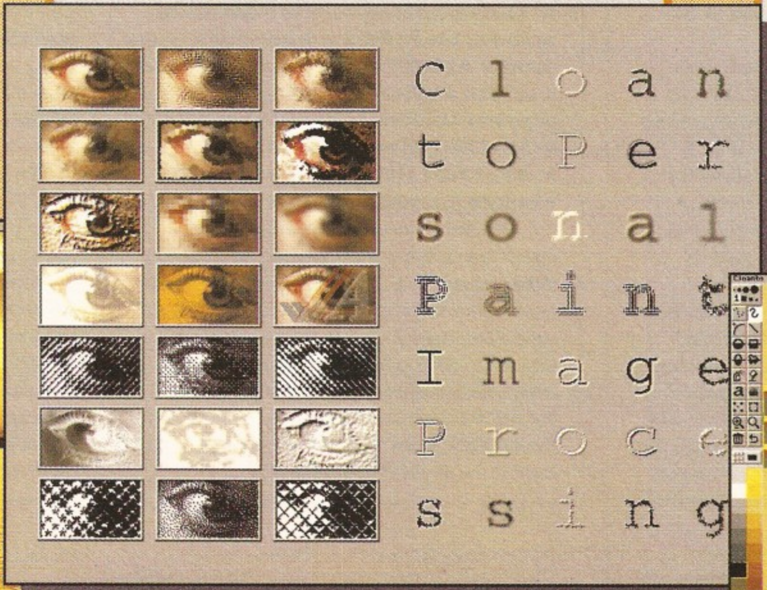
This time, I don't need a dictionary to read the manual. It is direct, clear and concise. It is detailed, yet simple and perfectly accessible to the beginner.

Christian Hamoneau, AmigaNews, France

... If you cannot believe all this to be true, read our review.

Rating: Editor's Choice







Animation Features: Storyboard, Superior Compression, Multiple Palettes, Frame-by-Frame Timing...

can't use a PCMCIA peripheral, such as the Zappo CD-ROM drive. Given that this unit is designed to ensure that the A1200 owner can continue to use their peripherals, this is a major omission which has definitely cost this product several per cent on the overall verdict. I suppose, if you are handy with a soldering iron, you could put in an angled socket, but this is not a practical idea for a typical user.

Conclusions

This unit is certainly an excellent idea and the execution is pretty good, but there are some problems which have to be borne in mind. The fact of gaining five Zorro slots has to be weighed against the loss of the PCMCIA slot and the problems with the mounting of the internal IDE drive.

If you are planning to add a SCSI hard disk interface at the same time, some of these problems will be solved, but you will still lose the PCMCIA slot and have problems with the IDE drive. With a SCSI card, both the CD-ROM and the hard drive can be replaced, but this is an extra expense.

It's most certainly not a cheap solution. If the A1200 costs somewhere in the region of £300, a combination of A1200 plus Z5 will cost you around £700. If you have bought an internal hard drive (say, around £150), this puts the cost up to £850. This is not far short of the cost of an A4000 and it still doesn't count the cost of an accelerator to give you a 68030 and some extra memory, which the A4000 comes with as standard.

But, there is always a certain amount of hassle in buying a new machine and installing software, setting up hard disks, and so on. This unit avoids all of this by taking the guts of your old machine and putting them into a new one.

However, it *is* expensive, so the real question is down to whether this unit will suit your individual needs. Personally, I would say that a great amount of thought is required before deciding to invest in this product, instead of buying an A4000. ■

Ramiga Z5 A1200 vs. A4000 vs. A4000T

So what exactly is the difference between an Ramiga Z5 "tower" system and an A4000? Let's see...

	Zorro Slots	Type	Video Slots	H/D I/F	CPU	Cost
Ramiga Z5	4	Z II	0	IDE 2 1/2	68020	£700
A4000	4	Z III	1	IDE 3 1/2	68030	£999
A4000T	5	Z III	2	SCSI 3 1/2	68040	£Not set

"If you have already **bought** an internal hard drive (say around £150), this puts the cost up to £850. This is not far short of the cost of an A4000."

Ramiga Z5

Documentation
Yuk. Eight sheets of (badly translated) photocopied paper, with only a few badly drawn illustrations. For a job which involves ripping your Amiga apart, more is definitely needed. Even basic information, such as the function of the turbo button, is very poorly explained and much other important information is missing.
Verdict: 40%

Ease of fitting
It's never going to be an easy process, but it is reasonably painless if approached with some caution and a bit of thought.
Verdict: 70%

Features
It does its job well, but the lack of any mounting for the IDE drive is a problem, as is the loss of the PCMCIA slot.
Verdict: 75%

Quality
Well built and designed (except for the PCMCIA slot and IDE drive problems). Technically, there is very little to fault it on, but it's a pity that the manual is so poor.
Verdict: 80%

Price
Expensive, especially as the case alone will cost you around £60 from any PC dealer.
Verdict: 70%

Overall

It does what it is supposed to do very well – adding Zorro slots to an A1200. It's also well built and tough. However, it is expensive – this makes it less attractive against selling up to buy an A4000 than it would be if it was cheaper.

Price: £399
Supplier: Ramiga International
Contact: 01690 770304
Verdict: 75%

Personal Amiga WorkStation (PAWS)

While the manufacturers of the Z5 and Z7 have been working on expanding your Amiga, other companies have been trying to make it smaller. One example of this is the PAWS (Personal Amiga WorkStation), which is apparently under development by US-based Silent Paw Productions.

In essence, they are attempting to make an Amiga-equivalent of a Macintosh PowerBook or a PC notebook. One obvious advantage to this is the posing factor – yes, you too can look busy and important while travelling on a train.

However there is a more serious benefit to such a development. Imagine being able to show clients work you have produced with the Amiga *on* the Amiga. This will cut out continually having to create projects, convert them to a displayable format, get feedback, make changes and then convert them again. As with the Z5 and Z7 systems, you will be able to keep all your expansion cards. You should be able to remove your Amiga and place it in the portable casing. The machine will run off batteries, as well as a transformer.

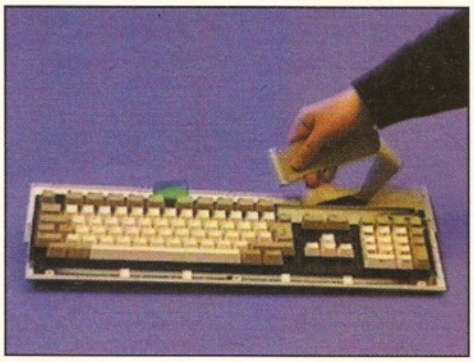
For display, the PAWS will use either Monochrome LCD or colour active matrix screens. These will provide VGA-like resolutions and colour.

The dimensions of the PAWS are: width – 14.5"; length – 14"; and height – 4.5". The screens will measure between 9.4" for monochrome and 10.4" for colour. The prices will range from $1,349 and $3,299 depending on the monitor you choose.

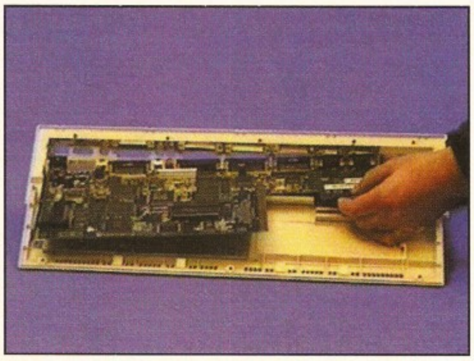
The PAWS system sounds like a promising product, but it is not finished yet. Also bear in mind that you are paying for a case, monitor, power-supply, battery and keyboard. You have to provide your own motherboard, hard drive and floppy drive.

Fitting it

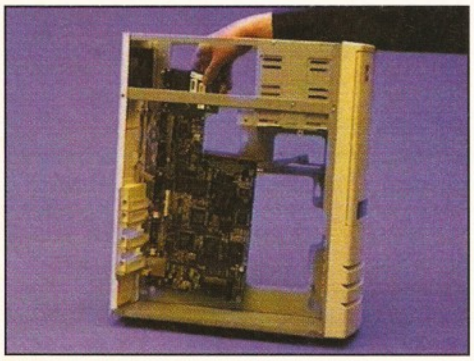
Fitting the Z5 is a fairly complex process, so here we show you exactly what this will involve. Remember that all of the components in your Amiga can be damaged by static electricity, so you should always wear an anti-static wristband.



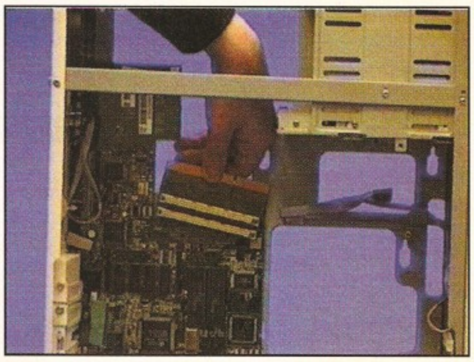
1 ***First, you have to get the A1200 motherboard out. This involves unscrewing the case, unplugging the floppy drive, keyboard and removing the metal screening.***



2 ***To lift the motherboard out, remove all of the screws at the rear of the case. As with all computer components, handle only with appropriate anti-static precautions.***



3 ***The motherboard is then fitted into the case. It's held in by two screws on the board and the screws which hold the sockets in place.***



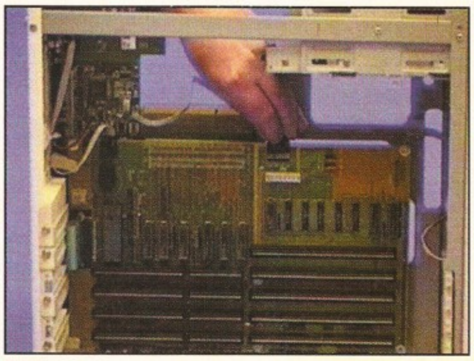
4 ***The expansion port connector fits on to the expansion port edge connector. This provides both a through port for the expansion port and the connectors for the busboard.***



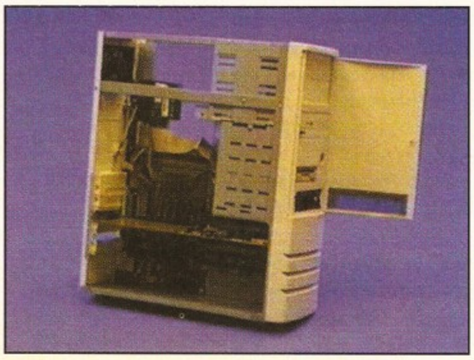
5 ***The busboard then fits on to the connector. Three screws hold it in place – plus, two support it at the rear. It all fits in pretty easily, with no real brute force required.***



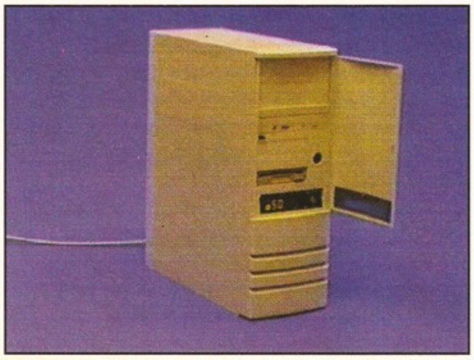
6 ***The floppy drive fits into one of the 3 1/2 inch drive slots and other drives in the range of other bays.***



7 ***Various connectors link bits of the case (such as the keyboard connector) to the motherboard and busboard.***



8 ***Put it all back together, plug it in and you should be off. If it's all working, you can fit any Zorro cards you may want to fit.***

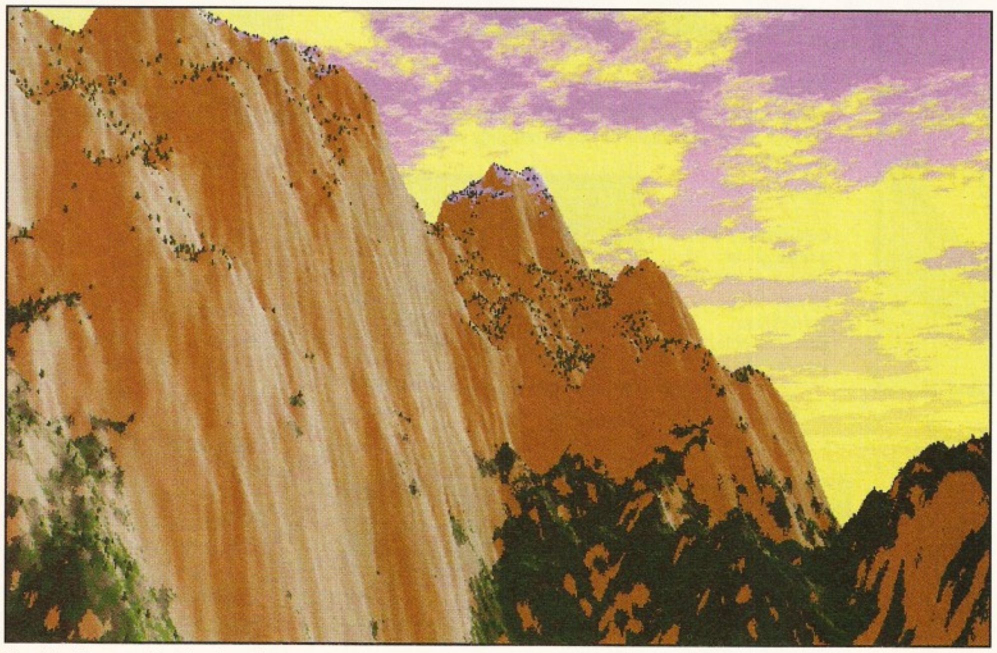


9 ***And there we go! The whole thing back together, including the unnecessary (but posy) clock speed display.***



Straight talk

Our man in the US, **R Shamms Mortier,** *talks to Brett Casebolt of Natural Graphics, the man behind one of the world's best fractal scenery generating programs, Scenery Animator.*



Producing realistic clouds was an interesting experience of trial and error, using fractal maths.

"It was the users' enthusiasm that led to further development."

I've known Brett Casebolt since 1987, when he first introduced the Public Domain version of Scenery Generator. The follow-up program, Scenery Animator has now become one of the world's best fractal scenery generating programs and runs on the Amiga as well as on the Mac and Power PC. Here is the gist of our latest talk.

How did Natural Graphics come about and what's the history of your involvement with the Amiga?

I was a 68000 aficionado from the beginning. I was employed as a Systems Programmer where I developed and maintained a text editor for newspaper editors, which was written entirely in 68000 Assembly language (it had the same CPU as the Amiga). So my decision to buy an A1000 in November 1985 was easy, especially as I already knew how to program it in Assembly language.

In late 1987, I began work on a fractal landscape program, which was eventually named Scenery. First I wrote it in BASIC, then it was re-written mostly in Assembly language – especially the CPU-intensive rendering code. After a couple of months the output quality progressed from what looked like an inside-out, jumbled mess on the screen, to a fairly decent natural mountain scene. In January 1988, I sent it to Fred Fish to be considered for his disk library. After about nine months, I found his letter of acceptance in my mailbox. I began to receive phone calls from interested users. It was their enthusiasm that led to further development.

In June 1989, when the first commercial version named Scene Generator was nearly complete, Natural Graphics was founded. I finished developing the program a few months later, and released it. The next problem was how to launch a new product with no money or business experience. I owe a lot of credit to Dennis Hayes and Greg Bahlhorn, who worked for a local computer store (now they work for Digital Creations). Greg convinced me to give a demonstration in front of an audience at our Amiga Club meeting. Over the next few weeks, the program sold quite a few copies at their store.

After placing small black and white ads in Amiga magazines, sales really took off. Scene Generator did well with little advertising. It got lots of word-of-mouth advertising, positive reviews, and user group volunteers eager to demonstrate it. In a few months, two other distributors decided to carry it.

Why and how was the transition made from Scene Generator to Scenery Animator?

The users demanded more. I received user registration cards, letters and phone calls with many suggestions. The features requested the most I finally added . As you can probably guess, the ability to change the camera viewpoint was one of the big winners, as was the ability to animate camera movement.

I decided it was time to completely re-write the program, and I did. It took about nine months. Scenery Animator went through two more major revisions after that.

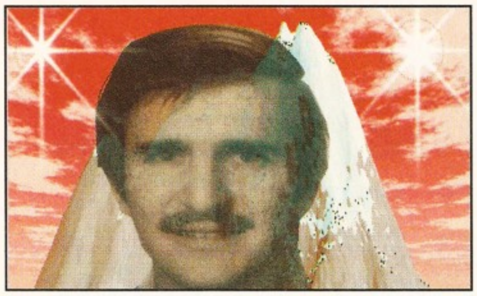
Some of your detractors say that they had the first DEM software on the market for the Amiga. What's the truth about this?

It depends on how you interpret the phrase DEM software. If you are talking about software that creates random fractal landscapes from a Seed number, then I was the first with Scenery, which was released in January 1988, and then Scene Generator in November 1989.

If, by DEM software you mean software that can load and render a landscape file created outside the program, then the first Amiga program that did that was Vista in May 1990. Scenery Animator had this feature beginning with its first release in June 1991. However, there was software on other platforms well before 1988 that could draw landscapes from fractal algorithms or DEM files – so neither Amiga program can claim to have invented anything new.

What are DEM files, anyway, and how does Scenery Animator incorporate them?

DEM (Digital Elevation Model) files are created and published by the United States



Brett Casebolt finds the Amiga users' enthusiasm inspiring.

Geological Survey Department. They contain elevation samples at fixed intervals. From these samples it is possible to reconstruct a 3D representation of a landscape.

However, a realistic looking landscape requires the addition of natural looking texture, shading and colouring and close up fractal detail – that is not contained in the DEM file. When rendering, Scenery Animator does not know (or care) whether it's rendering a fractal landscape or a DEM landscape.

The same data structures and algorithms are used for both. Any well-written fractal landscape program could become a DEM program with little work.

In general, how has the response been to Scenery Animator over the years?

Until recently the response has exceeded all our expectations. Sales have been best after a new release or a positive review. However, the recent loss of Commodore has caused Amiga sales to drop significantly, well below the level necessary to sustain the company.

Making the situation worse is the loss of some of our dealers and distributors. Fortunately for Natural Graphics, sales of Macintosh and Power Macintosh versions have more than made up for low Amiga sales.

What attributes has the present version of Scenery Animator got that make it different from other competitive products?

It has the friendliest user interface, and you always see what you are going to get in the preview screen before you render. Others force you to operate like a blind man.

It's faster because of its carefully-refined Assembly rendering code. It's the only program of its kind with full-featured animation capabilities, and with v4.0, it's the only Amiga landscape program that lets you import, position, and render user-defined 3D objects.

Can you talk about the way Scenery Animator incorporates the importation of 3D objects? What are the strong points of this capability?

Scenery Animator 4.0 can import 3D objects in the Geo file format – a simple ASCII file format that was created by Alan Hastings, the developer of VideoScape 3D, who is now the well-known author of LightWave 3D.

The best aspect of using this format is that many 3D objects are available. Also there are programs such as Pixel 3D Pro by Axiom Software that convert almost any format into the Geo format used by Scenery Animator.

Where do you see the development of scenery generators/animators heading in the future?

Currently most 3D graphics and animation programs work best for rendering indoor scenes with man-made objects. Objects in the natural world are more complex, requiring more computational horsepower and new algorithms. I think the future scenery generator will be a program module that is integrated into a general purpose 3D program.

If the Amiga market rebounds, are you planning any extensive upgrades to Scenery Animator?

I really hope the Amiga market rebounds. If the demand for Amiga software improves substantially, an extensive upgrade would likely follow.

However, since I'm sure that competitors are among those reading this, I'll have to keep quiet about details of any changes. I'll be working with Scenery Animator on other platforms while waiting for the Amiga market to improve. The Mac and Power Mac versions were released several months ago.

What has your response been in the European market? Do you have plans to enhance the way you address this market?

The European market is a very large portion of our sales. In early 1994 we signed a publishing agreement with a French company, so now there is a French language version of Scenery Animator.

Can you talk about your favourite attributes in Scenery Animator?

The first was the clouds. It was an interesting experience of trial and error, using fractal maths to generate realistic clouds. In Scenery Animator's first Amiga World review, the reviewer said the clouds were: "the most realistic I've ever seen on a computer screen".

The other exciting feature to develop was DCTV (a graphics adaptor) support. Natural Graphics is located very close to Digital Creations (now Play), and I know many of the employees. There is something about DCTV that makes the natural colours look more realistic. DCTV support was one of the last features added to Scenery Animator. When I saw the DCTV output of Scenery Animator, I knew it was time to release it.

What are some of the ways that folks are using Scenery Animator?

It's used as backgrounds for art, animation, and video. I have seen it used in several movies and commercials. The US Geological Survey has purchased quite a few copies to view the DEMs that they create. Also, it is used by cable TV companies and in computer art classes.

Do you have plans to address LightWave in a more direct fashion in the future?

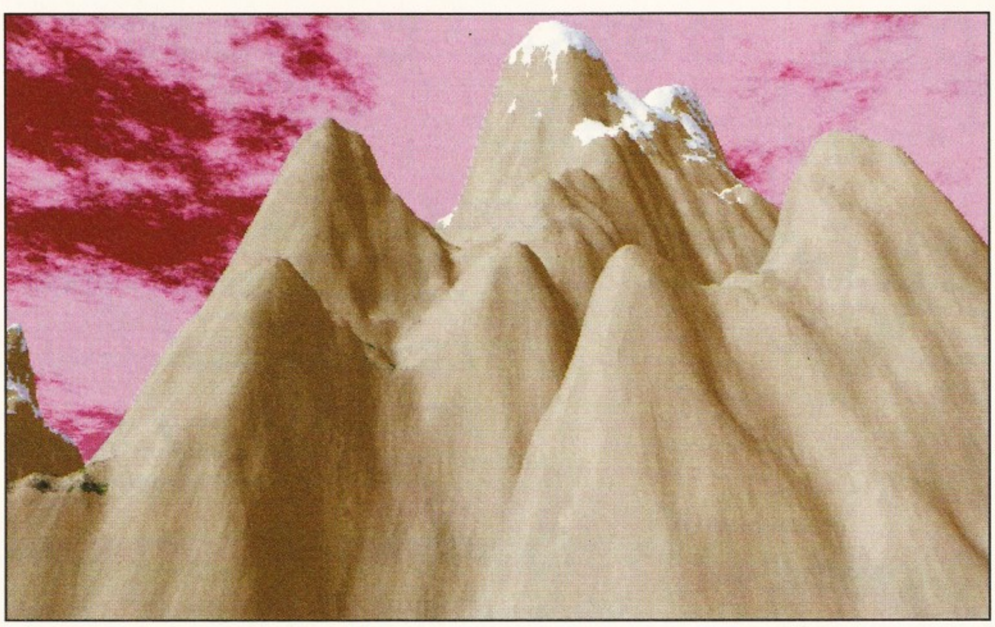
If the Amiga market rebounds and NewTek supplies me with sufficient information, LightWave support would be possible.

What would you hope for in terms of attitude and support from the new company that markets the Amiga? What is needed most, and in what order?

The best way they could help developers is to improve public awareness of the Amiga as a viable alternative to other platforms. Most of the people I know have never heard of the Amiga. After they get the production line running, they need to launch a massive advertising campaign explaining the advantages of buying an Amiga. Given the length of time Commodore has been gone, it will be like starting a new company. And I think they should approach it that way.

Have you got any final words of wisdom or advice to Amiga users and owners of Scenery Animator?

Yes. If the Amiga is reborn, then they can look forward to future upgrades and enhancements to the Amiga version. If not, Scenery Animator is currently available on the Macintosh and Power Macintosh. It should be available for Windows in a few months. ■



The future scenery generator will be a module integrated into a general purpose 3D program.

```
if (LEFT(ADDRESS(),6) ~= "
started by GoldEd ?*/
      address 'GOLDED.1'
'LOCK CURRENT'          /* lock G
OPTIONS FAILAT 6 /* ignore
SIGNAL ON SYNTAX   /* ensure
SIGNAL ON FAILURE /* trap He
address 'HEDDLEY.1' /* talk
EDIT SAVETEXT 'T:temp_node'
lock                /* lock Heddl
address 'GOLDED.1'      /* talk
open new 't:temp_node'    /*
'UNLOCK'               /* VERY im
EXIT                    /* quit thi
SYNTAX:                 /* ARexx er
```

Programming languages

Programming is more popular than ever. The thought of being able to get your computer to do exactly what you require it to do is appealing to most of us. But how do you get started and which language is the most appropriate for your particular requirements? **Dave Haynie** *explains.*

The task of recommending a programming language for you, the reader, is not only daunting, it's impossible. The choice of a programming language is a personal thing. Otherwise rational people have been known to get practically religious about the choice of language, sometimes even the choice of one system versus another for the same programming language. Only you can select the right language for yourself.

In order to select a language, however, one must have the proper information. Beginners need to know about languages that are easy to use, perhaps with some attention to why they are learning to program and where they may eventually go with that knowledge. Intermediate programmers may be looking for a way to "trade up" to a language that can give them more power or flexibility, without giving up what they've already learned. Advanced amateurs and professionals may be interested in taking their programming a step further, or learning a few special purpose languages to make everyday life easier. Scientists, engineers, artists, and so on may find that while they don't consider themselves programmers, they may need to write programs.

"Language" versus "system"

A computer language itself is nothing more than an abstraction. The implementation of that language is the program that converts this abstraction into actual computer operations. This may sound like splitting hairs, but it is important to realise. The system can easily determine how easy a language is to use, to debug, and how well suited it can be to different tasks. The same language may feel very different under two different systems.

Programmers usually equate the "language" with the program that processes it. These come in two types: interpreter and compiler. An interpreter loads the entire program at once and sequences through the instructions one by one. Each instruction activates a machine language subroutine that's part of the interpreter program. By contrast, a compiler reads the source program and produces a complete machine language translation before anything can run. Most compilers support the concept of linking, which lets individual pieces of a program be compiled individually, then combined into a whole binary version.

Aside from a compiler or interpreter, a complete language system offers tools to aid in the development of a program. Large programs are complex things. Tools can be provided to aid in the editing of program texts, project management, debugging and profiling (determining where a program spends its time). A good system will also provide interface routines to allow direct access to AmigaOS routines, and may supplant that with functions specific to the particular language, especially if that language has any standards for the functions available.

Essential features

Every language has a number of basic features in common. There must be a means of defining storage locations, or variables. There must be a way to read and write to an AmigaDOS device (sometimes the AmigaDOS library calls are the only such interface), some way of testing a stored value, and some way of making decisions based on this value (conditionals). It must have some means for changing stored values (assignment and arithmetic). It must have some way of altering the flow of a program (jumps and loops).

Beyond the basics, most modern languages have some concept of data types. A type is an assignment of a particular meaning to a memory location. Most high level languages can support integers, characters, and floating point numbers – possibly several types of each. These are known as "simple" types. A more advanced simple type is the pointer, which is nothing more than the address of some data type. Languages that support pointers include operators to convert between a value and that value's address. More sophisticated languages support complex types: some kind of group of other data types. Arrays are fixed length tables of a single type; most languages support several dimensions in an array. Structures

What is freeware?

"Freeware" is a generic term for software that can be distributed, at least within limits, without cost. This doesn't mean that just anything can be done with the software, there are often valid restrictions on some of the code that's around. Popular terms for the various flavours of freeware include:

- **Shareware** – This is copyrighted software. It can be tried out, but some payment is expected for continued use.
- **Demoware** – This is copyrighted software. It is crippled or limited in some way, with a full version available for a payment.
- **GNU** – License software released under the GNU public license must be distributed in full, including source and, usually, as long as none of the source code released is used for commercial gain.
- **Public Domain** – Software released to the Public Domain is free of restrictions. Anything can be done with it; it can even be incorporated in commercial programs.

31 (sometimes called records) are groups of different types stored under a common type name. Very sophisticated data constructs can be created with the combination of structures and pointers.

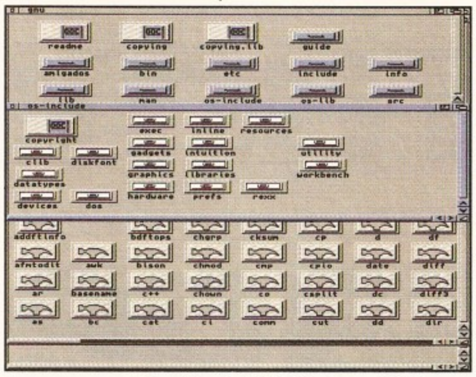
Some languages offer built-in dynamic complex types. A data type is said to be dynamic if its size can shrink and grow as required. A common dynamic type is the string, which is an array of characters of varying length. Another common dynamic type is the list, which is something like a dynamic array, but can usually contain arbitrary types, including other lists, at each position. Note that such dynamic types, and many others, can be implemented in a language that supports structures and pointers.

Another common feature is the procedure, also known as subroutine or subprogram. Simple procedures are merely jumps that store a return location, sometimes just referenced by an address or program line number. More sophisticated procedures allow the passing of variables, called parameters, in various ways. Often a value can be supplied to the superprogram on return; procedures that return values are usually called functions. Good languages allow procedures to define local variables, variables that only exist within the context of the procedure. More advanced languages support the concept of recursion, the idea that a procedure can be used in its own definition (called with different parameters).

Advanced features

Beyond the basics, a good modern language has support for modules. A module is a separate program unit, which can contain types, variables, and functions of its own. In compiled languages, a module is usually the smallest unit of compilation. Modular languages have some control over how much of a module can be seen by outside programs and how much is local to that module.

Taking the modular concept a step further is the idea of the class. A class is a fully abstract data type, which can contain both



I recommend the Fresh Fish Series of CD-ROMs to anyone serious about programming.

data and function elements (called methods in this context), and control the visibility of these to the outside – an object is an instance (variable) of a class. There is also the concept of object inheritance, in which a new object can be defined based on an existing object.

This new child object has access to the data and methods of the parent object, because in essence it is the parent object, plus something else. Many such languages support polymorphism, the idea that methods are dynamically bound to a particular object, rather than the object's class. This powerful mechanism eliminates much of the type-testing done when processing structures composed of similar, but non-identical objects.

Related to both objects and modules is the idea of function and operator overloading. Most languages have some kind of overloading built in. For example, the "+" operator may work on integers and floating-points alike, although it results in different functions being used. Some languages allow user-defined classes to define their own use of the language's operators or functions. This is another level of abstraction, effectively hiding the fact that a class is user-defined, rather than built-in.

Where do *you* fit in?

Simply put, your needs and desires drive your choice of language. There may be little point in selecting the most sophisticated language available if it's too difficult for you to use, too slow to execute, etc. On the other hand, the selection of a language that's too simple for your needs may result in unmaintainable code, missed release dates, or intractable bugs. It's rare for a programmer to stick with the same language for all things and all of the time. And by the time you've used 20 or 30, learning the next one can be fun.

Your first language

The choice of a first language can be a difficult one, simply because a non-programmer has little basis upon which to make a good personal judgement about a language. While in theory any language might be selected as a first, it will be easier to learn if the language system helps one along. Some features valued by a professional programmer may get in the way of beginners. To learn a language you need to write programs, anything that gets in your way will slow the process and possibly turn you away from it.

The languages I recommend for beginners all have one thing in common -- an integrated environment of some kind. This makes programming easy, since there's little to do but write a program and then run or compile it. The immediate feedback one can get from interpreters or text editors with line-by-line syntax checking is also a boon to beginners, offering a constant reassurance that things are being done correctly. There is, however, no reason why some of these "first" languages can't be used for professional-quality work.

The worlds of BASIC

The BASIC language is among the oldest and most popular of languages in use today. BASIC, or Beginner's All-purpose Symbolic Instruction Code, was invented at Dartmouth College in the 1960s by Dr. John G. Kemeny and Dr. Thomas E. Kurtz. It began as a very simple, unstructured language, which is interpreted and run only from an integrated environment of some kind.

Today's BASICs incorporate structured programming concepts from languages such as Pascal – such as modern control structures, some subprogram facility, and long variable names with local/global scoping control. To some extent, the BASIC environment traditionally isolates the user from the underlying machine, which is good for beginners but trouble for advanced programmers. Most Amiga BASICs allow direct access to the operating system, as well as providing an easier level of access to many special Amiga features. BASIC has traditionally been an interpreted language, but the trend today is toward compilers with integrated environments.

AmigaBASIC

At one time, Amigas shipped with a BASIC interpreter. Originally it was a rather strange dialect called ABasiC (written by Metacomco for Commodore). That was replaced with

The Fresh Fish Series

I highly recommend the Fresh Fish Series of CD-ROMs to anyone serious about programming on the Amiga. There are several other CD-ROM series, including AmiNet archives and Fred Fish's archives, but perhaps none are as useful as a general resource than the FreshFish series. These disks are compilations, released approximately every two months, of the best of the latest freely redistributable Amiga software.

In addition to the new programs that appear each month, the Fresh Fish disk has a number of resources designed to be used in-place. These include the GNU programs, a "best of" of other useful AmigaDOS utilities, libraries, drivers, etc. AmigaOS include files are also provided for C language, Assembly, and occasionally other languages. Many of the Commodore-designed developer tools are also included.

Another important resource on these disks is source code. The best way to learn a language is by studying examples and by just doing it. While most language systems come with simple examples, more examples are always useful to anyone learning a language. They can also be important as an aid in learning the particulars of the AmigaOS. The dominant language is C language.

Source code is provided for the GNU tools, lots of Amiga examples from the Commodore Amiga Technical Support group (CATS), and of course, some of the other freely redistributable programs. If you're intent on learning to use C language on the Amiga, there's an excellent "Amiga C Encyclopedia" by Anders Bjerin.

AmigaBASIC (written by Microsoft for Commodore), a fairly normal, modern dialect of BASIC. Unfortunately, it had a number of problems with 32-bit Amiga systems and was discontinued even before Commodore's problems began. AmigaBASIC users may consider moving to another version of BASIC. Some newer BASICs aim to be AmigaBASIC-compatible, others will support AmigaBASIC programs with some re-programming.

ACE

ACE V2.0 (David Benn) is a freely redistributable compiler for the AmigaBASIC language. It actually accepts a subset of AmigaBASIC. It will run on a 512K system under AmigaOS 1.3-3.1. More memory is necessary for longer programs. ACE on CD-ROM comes with a number of BASIC examples, including AIDE, a simple integrated environment front end to the ACE compiler. While this isn't the fanciest integrated environment around, it does the job, and the inclusion of the source provides a good example as well as the option of tuning for individual preferences.

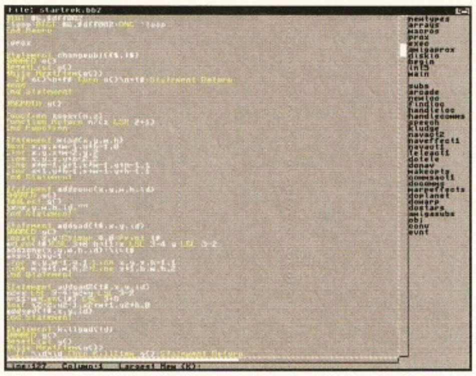
The ACE language extends AmigaBASIC considerably. It supports an #include directive and block comments, like C language. Also like C, it has address and de-reference operators, to support pointer arithmetic more naturally than in AmigaBASIC. Command line or Workbench arguments may be accessed in an ACE program. SUBS can be recursive, and can have return values. STRUCTUREs can be defined, like struct in C or RECORD in Pascal. ACE also contains a set of turtle graphics commands, popular in the Logo language. It extends AmigaBASIC's sound support to handle arbitrary waveforms.

Like most compilers, ACE operates on ASCII only, not tokenised AmigaBASIC files (a conversion program is included). Like some C compilers, ACE produces 68K Assembly language as its output, which is processed by the freely redistributable Assembler a68k (Charlie Gibbs) and linker blink (Software Distillery), also included. All support code for the compiler is included by the linker, there is no separate "run-time" file or library needed, so ACE-compiled programs are truly stand-alone.

AMOS BASIC

AMOS BASIC (Mandarin Software/Europress Software) is a version of BASIC with special emphasis on graphics and animation. This is largely the work of one FranÁois Lionet, and is quite an ambitious body of software. There is not one AMOS BASIC, but several. There is the starter package, "AMOS: The Creator", the scoped up version, "AMOS Professional", the 3D add-on, an interactive 3D object modeling program and BASIC language extensions for programming with such objects, and two Compiler add-ons, one for plain AMOS, one for AMOS Pro.

The Professional version is by far the better package, supporting a much nicer user interface, 700+ functions, and over 4Mb of other goodies. The plain version has problems



BlitzBasic 2 is an innovative BASIC compiler compressed on four disks.

on the 68040, too. Release notes confirm that this V1.12 of AMOS Professional works on the A1200 and A4000, though it doesn't yet use any AGA features.

The AMOS environment starts up on a multicolored custom screen in the smart editor, which understands the AMOS language. The editor understands procedures, and helps you manage them with procedure folds. A help system can describe any element of the AMOS BASIC system. This is a good text editor, with multi-level undo, multiple file support, as well as basic editing functions. A program can be run, or launched into the "monitor", an interactive debugger which can single or slow step through a program, showing its display in a window while the stepping takes place. Breakpoints can be set, and variables examined or changed. This is an excellent and very easy to use programming environment.

The language is a structured BASIC, supporting long variable names, structured control and conditional constructs, and recursive procedures (but not functions, though there is a somewhat clumsy way to have a function return a value). The main point of AMOS, however, is its ability to create games and other programs with a game or multimedia feel, at a fairly high level, in the tradition of BASIC.

High level support includes functions for IFF, MED, and other Amiga standards, an animation sub-language, and an application building language for the "AMOS Interface". AMOS provides direct access to the underlying Amiga system and Assembly routines. Library functions and devices can be called from AMOS. Since AMOS does not support user-defined data structures, some functions are provided to kludge structure access for the library/device interface.

The compiler is an add-on that produces AMOS programs that can stand-alone, or optionally access a share library of AMOS functions, saving nearly 50K per program. The compiled AMOS code is definitely faster than the same thing run in the interpreter, but it's no speed demon either. I had more trouble with compiled programs crashing than I did under the interpreter.

Overall, I can recommend AMOS Professional to the beginner; it's one of the few interpreted BASICs left. Its wealth of functions is true to the BASIC spirit, and I can imagine that programs written in AMOS may take months less to complete than in C or Modula2, especially for the beginner. It lets you spend more time concentrating on the big picture than the little details. My only complaint was that some examples locked up or crashed my 68040-based system. While that's perhaps understandable in a system this large, it does call the "professional" designation to question.

BlitzBASIC

Blitz BASIC 2, V1.70 (ACID Software) is an innovative BASIC compiler. The system comes compressed on four disks, with integrated editor/compiler, libraries, example code, and Public Domain examples. The editor knows the extensible language and displays key words in a highlight colour. Programs can be compiled and run from the editor. When an error is found at compile time, the editor returns to that line. There's also a post-mortem source debugger which can trap errors that would otherwise cause system crashes. Also included with the review package is a large format reference manual and a smaller user manual, with the first five issues of the "Blitz User" newsletter reproduced.

The BlitzBASIC language itself is an extensive structured BASIC. It supports long variable names, constants, structured control constructs, macros, functions and subroutines, etc. It also supports user-defined types, and a rich set of built-in types includes byte, word, long, fixed-point, and single-precision floating-point, dynamic strings, arrays, dynamic lists, and pointers. Modules support isn't built into the language, but there is a mechanism whereby modules can be written and linked into the language. An "include" mechanism quickly loads precompiled headers. Typical compile times on my system are a second or two for most of the examples, it's not always obvious this isn't an interpreter.

BlitzBASIC supports a reasonable set of commands. Quite a few of the Intuitions, graphics, and other Amiga functions are driven by BASIC commands closely aligned with the internal Amiga structures. These provide good control of Amiga-specifics without the need to make direct Amiga calls, in keeping with the ease of use goal of most BASICs. Various

Tools in cyberspace

All freeware for the Amiga is available somewhere in "cyberspace". The Internet is perhaps the best place to look for it. There are AmiNet archives worldwide that contain gigabytes (Gb) of such software, and World Wide Web servers with a variety of Amiga information, much of which is very useful to the programmer. Commercial and private BBS systems also contain these programs, and some of these systems are frequented by experts who can often lend a helping hand to the novice programmer. If you're interested in learning to program, seriously consider getting connected.

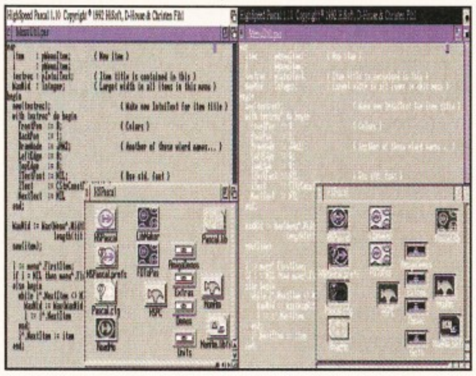
33▶ BlitzBASIC libraries extend the language in a natural way, and several of these, such as AREXX and 3D libraries, are included. There is a good bit of low-level support in BlitzBASIC, for programming "close to the metal". You can write interrupt routines, copper lists, or Assembly language.

If that's not fast enough, a special mode called "Blitz" mode can shuts down the Amiga OS and runs entirely under the control of Blitz library functions. This, in theory, allows the game programmer to get faster and more sophisticated than one might with the OS alive, though of course no OS functions are available during this mode.

A few tests crashed on my system. Other than that, I had no complaint. BlitzBASIC is a faster and more sophisticated language than most other BASICs, if perhaps a bit odd. It is especially well suited to writing arcade games. The newsletter and Public Domain games disks show that there's continuing support for programming in BlitzBASIC.

HiSoft BASIC 2

HiSoft BASIC 2 (HiSoft) is a BASIC compiler with editing environment. It is supplied on a single disk in compressed form and uses the Commodore installer for installation on hard disk, floppy, or both. It works under AmigaOS 1.3-3.1, though 1.3 is not recommended.



Pascal is one of the most popular languages for teaching at college level.

It requires at least 1Mb of memory, and it can run from floppy or hard disk. It comes with a 626-page manual that has tutorials for beginners and experienced BASIC programmers. The emphasis is on standards rather than cleverness; the dialect of this BASIC is based on AmigaBASIC and Microsoft QuickBASIC

Programs are edited in a text editor, much like the editor used for HiSoft's Pascal, or DevPac Assembler. This is all you need; programs can be edited, compiled and debugged from within the editor's environment. Both the editor and HiSoft BASIC itself are modern Amiga programs. The editor supports AmigaOS 3.x features like NewLook menus and AppWindows (you can drop a file icon into the editor's window to edit that file), and it can open on a named public screen, creating that screen if necessary, or on your choice of custom screen, selected with a standard screenmode requester. Examples are provided for generic things and features specific to 2.04, 2.1, and 3.0.

The compiler is a true compiler, and can produce a stand-alone binary program. Optionally, it can access the runtime environment via the HBASIC2.library, a standard Amiga shared library. Normally, compiling from the editor produces a binary directly. However, linking with C code is supported, and automatically causes an object code file to be produced instead, which is linked with the C code with a normal linker. AmigsOS routines can also be called.

In both cases, the lack of structured variables makes interfacing a bit of a kludge, but it works. Like most compiled languages, HiSoft BASIC uses a separate debugger, in this case HiSoft's low-level debugger, MonAm, also used in other HiSoft packages. This release 3.05 of MonAm is Enforcer aware, which helps catch errors. Although low-level, MonAm can relate source code to the machine code it's examining.

The Pascal language

Niklaus Wirth of the Institut fur Computersysteme ETH, has been designing languages since sometime in the 1960's. He is famous for the Pascal language, at least at one time the most popular language for teaching at the college level – it was one of the first languages to support structured programming, but it wasn't well suited toward advanced or professional use; it didn't support modules, full pointer mathematics, or any standard disk I/O functions. Despite Wirth's best efforts to replace Pascal, though, it has retained a large following in the microcomputer world.

This has been mainly due to the Borland "Turbo Pascal" compiler on the IBM PC. Borland sold a cheap Pascal compiler back when C was new and expensive. They (and a few standards committees over the years) also improved the language to support most of what Modula-2 ultimately did. Due to Pascal's popularity in colleges, many people chose Turbo Pascal over C. Borland's latest version even supports objects. A good modern Pascal may be just as good a professional tool as C language. I include it here because, based on Pascal's teaching heritage, many will find it easier to learn.

HighSpeed Pascal

HighSpeed Pascal (HiSoft) is an enhanced Pascal development system. It comes on four disks with two manuals, User Manual and Technical Reference, at about 500 pages combined. The system includes the compiler, an integrated editor, and library support units. The compiler strives to be Turbo Pascal-compatible, and is close to the ISO standard as well. As such, it's an enhanced Pascal, program

The GNU project

If you are using freely redistributable languages, you won't usually get a complete development system with a typical language. The GNU project can help here, and it's worth investigating even if you do have a full development system. The GNU project (GNU is a recursive acronym for "GNU is Not UNIX") began at the Computer Science Department of MIT, and is now overseen by an organisation called the Free Software Foundation. While GNU has yet to deliver a full UNIX operating system, it has done exceptionally well at building freely redistributable versions of many of the software development tools that made UNIX famous. GNU tools are available throughout cyberspace and on the Fresh Fish CD-ROM (the September 1994 release lists nearly 200 GNU tools ported to the Amiga). A small sampling includes:

bison – A program for generating parsers.
diff – Compares two files, lists the differences.
emacs – GNU Emacs, perhaps the world's most powerful text editor.
flex – A program for generating lexical analysers.
find – Search for a specified file or files.
gawk – A version of the UNIX string processing language.
gcc – The GNU C/C++ compiler
gdb – The GNU debugger, a source-level debugger for C, C++ and Modula2.
grep – "General regular expression processor", a bit like the AmigaDOS "Search" program, but more powerful.
ksh – The Korn shell, popular with UNIX fans.
make – A version of the classic file dependency manager.
rcs – A revision control system, for managing and documenting program generations.

Basic documentation on all GNU tools is available in the UNIX "man" format. Some of the GNU documentation is available in AmigaGuide format as well, which is much easier to browse through than "man" pages. On the other hand, man pages can be printed pretty nicely if a hard copy is desired.

The GNU C compiler is certainly something for anyone interested in C or C++ to investigate. It takes some pretty heavy system resources, lots of stack, lots of hard disk, and at least 4Mb of system RAM. But it is highly regarded for the quality of code it produces. In fact, gcc was used in the later releases of AmigaUNIX because it was significantly more efficient than the 680x0 compiler from AT&T and Motorola.

One interesting aspect of the GNU project is its copyright, The GNU General Public License, a licensing agreement called a "copyleft". According to this agreement, all GNU source code must be made available by anyone who makes the binaries available, and no additional restrictions can be placed on any code derived from this code. The CD has both documentation and code, the latter in compressed format. Another nice thing about GNU tools is that, thanks to this freedom of distribution, they have been ported to nearly every hardware and software platform.

modules, pointer mathematics and everything you'd normally associated with C or other full powered development languages.

Finally, it handles online Assembly extremely well, with a full-powered Assembler that transparently supports Pascal variables, even records to a degree. The editor is good, reasonably powerful, and integrated with the compiler and debugger such that nothing needs to be written to disk during development. The MonAm debugger is included, as with HiSoft BASIC and DevPac.

The system includes modules that are compatible with the Borland Turbo Pascal DOS and graphics libraries. These aren't as powerful as the built-in DOS/graphics libraries, but they're sometimes easier to use and good for portability between the Amiga and the IBM PC. The Amiga modules are supplied in a pre-compiled library unit and in source form. This is a great system for Pascal on the Amiga.

Easy C language

The C language is the overwhelming choice of professional programmers. Virtually all Commodore-produced example code is in C, as are some of the best of the development tools on the market and in freeware. While it's a fully-structured, procedural language, C is lacking in many of the higher-level special features that beginners often find useful, such as an easy interface to the Amiga operating system. Additionally, its somewhat low-level approach to things may make it confusing to the beginner.

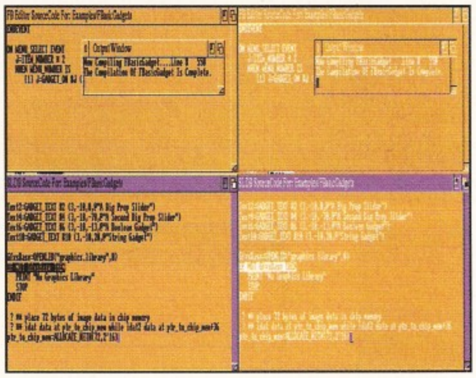
On the other hand, since it's an overwhelmingly accepted standard, it's reasonable for a beginner with ambition to consider it. Toward that end, I recommend first trying a freeware version of C.

That way, at least, no large cash investment has been made. The best freeware compiler is the GNU compiler, which handles C and its object oriented extension, C++ (see the box on page 31). However, GNU C requires a pretty powerful system; you'll need a hard disk, at least 4Mb of memory, and a fast CPU to be happy with GNU C, but it does produce good code. There are some alternatives for the beginner, though you better come armed with a book or the freeware tutorial on the C language; neither of these will teach C.

Dillion's Integrated C Environment (DICE, by Matt Dillon) is a pretty nice system, designed specifically for the Amiga by Matt Dillon. The freeware version of this comes with DICE-specific include files, a compiler, editor, and linker, but you need to find the Amiga includes somewhere else.

The editor is a bit quirky, and not menu driven, but it's small and fast, and everything is very Amiga-friendly. There are limits to the freeware version. If you're happy with this, you can purchase a commercial version from Obvious Implementations, Inc.

HCE 1.0 (by Jason Petty) is another freeware C compiler. This is a true integrated environment; the editor and compiler are in the same program, and the source is included. Like DICE, you must obtain Commodore include files to access the Amiga's operating



F-BASIC is probably the most sophisticated version of BASIC 1 around.

system. Like many freeware language systems, HCE uses the a68k Assembler and blink linker to complete its system. Modules are limited to about 2,000 lines, but programs can be any total size. The editor is not bad, but fixed as a custom PAL screen (even on NTSC machines).

Getting serious

Some languages are, for various reasons, more sophisticated than beginners favour, while at the same time they are not professional choices. These languages are not overly difficult, but some advanced concepts are better dealt with by experienced programmers. Most of these can do the same jobs that professionally-oriented languages can.

Amiga E

Amiga E V3.0a (by Wouter van Oortmetssen) is a freeware language and compiler system designed by its author specifically for the Amiga. As of V3.0a, the free compiler is limited to producing object files of less than 12K in size; an unlimited version can be ordered from the author for 65 Dutch Guilders (approximately 26 pounds sterling). The compiler runs in OS 1.2 on up, and gets extra features in OS 2.04 and beyond.

While the E language is unique, it shares features with other modern languages. It is something like pre-ANSI C, with very relaxed typing and a low-level world view. However, it has more advanced built-in complex types, including strings and lists (fixed and dynamic), etc. Single-precision floating point is supported, but tricky to use. Recursive procedures can have arguments, local variables, and multiple return values.

There are built-in functions for dynamic memory allocation. E has a full exception handling system, which cleverly allows user exceptions on built-in functions as well as user functions. E supports object and modular programming; modules can be defined, with the external visibility of module components fully controlled. User-defined structures are allowed, and they support single inheritance and virtual functions, for full control over data encapsulation. Modules are provided for all Amiga 3.x libraries, MIDI, and REXX.

For freeware, there are a fair number of E tools available. A C-style preprocessor (by Lionel Vintenat) for macro processing, a profiler (by Michael G. Binz), an editor/development environment (still in beta, by Barry Wills), a YACC style parser-generator, tools for AmigaGuide support, module management, etc. Some of these include source, and other source examples are provided, some for AGA-only systems. Some of these will only run in AmigaOS 2.04 or later, while the AGA demos require AmigaOS 3.0 or 3.1 and an A1200, A4000, or CD32.

I can recommend Amiga E for anyone looking for fun in programming. It's not portable to another platform; it's not an ANSI standard; and it might be a bit tricky for the beginner. On the other hand: it's fast; it seems to produce decent code; I didn't get any Enforcer hits from it; and it's designed to support good programming practices. You can try it for free as long as you like, with no loss of features and the registered full version itself is a good value.

F-BASIC

F-BASIC 5.0 (Delphi Noetic Systems, Inc.) is described as "an enhanced extension of the BASIC programming language". It comes on three disks to be manually installed, with the F-BASIC system, a 260-page manual, a 26-page manual on 5.0 updates, and a 16-page manual on the source-level debugger. You can learn to use F-BASIC from these manuals, but they don't teach programming. The package comes with the F-BASIC compiler, editor, linker, debugger, several libraries, and many examples. Among the library files is an AmigaOS interface library, which seems to include most 1.3, 2.x, and 3.x library functions. There are also routines for loading various IFF files.

The F-BASIC language is recognisable as a compiled BASIC, but from the start there are noticeable differences from the "traditional" BASIC. Variables must be defined before being used, and simple types include INTEGER (32-bit), WORD (16-bit), BYTE (8-bit), TEXT (string), REAL (single-precision floating point), and DOUBLE (IEEE double-precision floating point). There are the standard control structures like GOTO, but also versions of all the structured language features: long variable names, structured control and loop constructs, recursive functions and subroutines, include-files, user-defined types, modules with data hiding, and operator overloading (e.g. you can define what "+" or "*" does for your own RECORD types).

One unusual feature is that strings are static rather than dynamic – you declare the maximum string size when you define the string. This is different than virtually all other BASICs, though similar to most compiled languages. It also supports pointers as first-class types, and even has a powerful PATTERN data type for text processing, much like the SNOBOL4 language. It also has a sophisticated event processing system, which automatically calls up F-BASIC routines for a number of special events, such as mouse activity, gadget hits, AREXX interaction, serial port input, etc.

F-BASIC programs can be created with any text editor, though the supplied "FEd" editor gives it an integrated feel. F-BASIC can run

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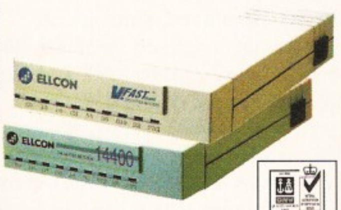


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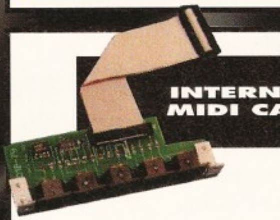


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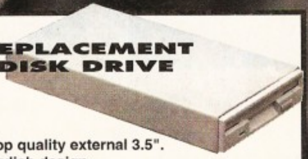
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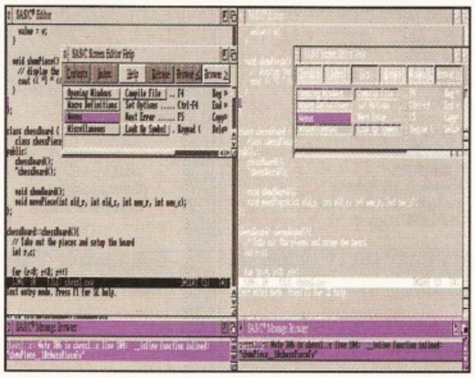
35▶ simple programs without any visible compile, link, or dump to disk, and it supports linking for large multi-file projects or for stand-alone programs (Dephi Noetic Systems requires compiled F-BASIC programs to be registered with them). The compiler will optimise for 68020-68040 processors if so instructed, and it can generate direct FPU code for 6888x or 68040 maths processing units. A source-level debugger is supplied, but it acts erratically on the 68040 processor.

The F-BASIC system is the most sophisticated version of BASIC I have come across. It probably serves best as an upgrade for established fans of BASIC, it'll be easier to pick up than C or Modula-2. Like all BASICs, there are certain dialectic differences to learn – you won't be able to take AMOS BASIC or AmigaBASIC sources directly into F-BASIC most of the time, but the transition will be much easier than going to a different language.

J-FORTH Professional

The FORTH language was invented by Charles Moore as a language for controlling telescopes. It's based on a set of functions, or "words", and a stack for communication between them. Words place data on to the stack or strip it off. J-FORTH Professional (Delta Research) is a development environment for the FORTH language. The floppy disks contain the FORTH system, tutorial, libraries, and examples. It installs easily, but uses far too many different Assigns. The large manual contains three short tutorials on the FORTH language itself, but nowhere enough to actually teach APL.

The dialect is compatible with three major FORTH standards (FIG, '79, and '83), and the AmigaOS API too. Editing can be done using a



SAS C/C++ 6.5 is a mature and well-designed development system.

supplied AREXX-knowledgeable text editor, your own text editor, or it can be done using the traditional and portable FORTH "BLOCK" environment. J-FORTH preserves the feel of the integrated environment, but it is an incremental compiler rather than an interpreter. A module feature builds pre-compiled modules, which take less memory during development than incrementally-compiled words. Completed programs can be compiled stand-alone and even "ROMable".

FORTH's natural extensibility is put to good use; several enhanced modules are provided. It has a system for creating and manipulating C/Assembly-compatible data structures and unions, which are a vital factor in calling Amiga system libraries. The distribution provides a set of AmigaOS 2.04 include files to support this as well, and a program for converting ".C" includes to ".J"includes. There are easy-interface words for accessing graphics, menus, IFF (including ILBM and ANIM forms), and AREXX. There is also an objects system which is well suited to building data types for large projects.

The professional choice

Professionals use languages that have been proven over time as reliable, efficient, and appropriate to the task at hand. Many professional programming tasks involve large, complex programs that must be maintained over time, which puts additional demands on a language system. In many cases, multiple people and even company standards are at play, so a professional may not have the choice afforded an advanced amateur.

The C language

The C language itself was originally designed at Bell Laboratories by Brian W. Kerninghan and Dennis M. Ritchie as a small, efficient language for writing operating systems. Many years later, an ANSI committee created a specification for the standard, which generally improved the language by adding stronger data typing/checking and more standards for behaviour and library support. C itself is a small structured language with a reasonably rich set of operators.

SAS C/C++ 6.5

The SAS/C Development System (SAS Institute, Inc.) is the standard by which other Amiga languages are measured. It comes on seven floppy disks. Documentation is in two loose-leaf binders, a quick reference guide, and online documentation. It installs to hard disk with the Commodore standard "Install" utility. The system includes the optional C++ front

Other languages of interest

It was both impractical and impossible to include here every existing language for the Amiga computer. There are a few, however, that I felt were worth a mention, even if a full treatment wouldn't fit in the allotted space. Most of these are freeware languages that programmers may wish to investigate out of casual interest, or perhaps as a prelude to buying a more complete commercial version.

● **A68K** – This is a very popular freeware Assembler by Charlie Gibbs, used as the back end for several freeware compilers. Unless you're doing full-time professional Assembly language development, this may be all you need, and it has some advantages over several of the Assemblers bundled with commercial high-level languages.

● **AForth** – This is a very basic FORTH system for the Amiga. It supports the FORTH-79 standard very closely, but lacks Amiga interface words. If you're intrigued by FORTH, try this.

● **BC-FORTRAN** – This is a freeware FORTRAN-77 implementation. Nothing fancy, but it works. There is a registered version available that supports FPU hardware for fast floating point.

● **Comeau C++** – Comeau C++ 3.0 is a commercial C++ compiler. It is a very complete version of C++, handling all of the latest constructs, except for the C++ exception model. This compiler requires a C compiler as a back end, and supports both SAS and DICE. Before SAS incorporated C++, this was the only game in town, and is still a bit more complete than SAS's C++.

● **GNU C/C++** – As mentioned in the freeware sidebar, this is a very good compiler system from the Free Software Foundation. This is the only way to try out C++ without buying a package.

● **Icon** – This is the Amiga version of Icon, a string-processing language by Ralph Griswold. Icon is perhaps the world's most powerful language for string manipulation. Unlike its predecessor SNOBOL4, Icon is a modern structured language like C or Pascal. Lots of fun!

● **The J Language** – This is a new mathematics language from Kenneth E. Iverson (the inventor of APL) and Roger Hui. Unlike APL, J uses the normal ASCII character set, which may be easier for some users. A good introduction to APL-like languages.

● **PERL** – PERL is an advanced Shell programming language popular on UNIX systems. It is a fairly modern language, with special attention to string processing and making the most of using Shell commands as part of the language.

● **SNMA** – Samu Nuojua's Macro Assembler, a CLI-based Assembler supporting all 680x0, 6888x, and MMUs up through the 68030 and 68882 (no 68040 special operands, but, of course, it can assemble code to run on the 68040). This also has an AREXX port.

● **XLisp** – This is a version of the LISP language with object-oriented extensions. LISP is an extremely powerful, interpreted, highly recursive language designed to process typeless, nested lists of data. LISP has been very popular in the artificial intelligence community for decades.

● **XScheme** – Scheme is a LISP-like language designed for compilation rather than interpretation. It has some of the flavour of LISP, but like most compiled languages it's statically scoped and a bit less free-form than true LISP.

end translator, the main two-pass compiler, global and peephole optimisers, and various other functions as Amiga shared libraries.

Much of SAS can be used from the Workbench, including compiler configuration, project management, and the se text editor. Using se delivers a seamless environment, which many users favour, but other text editors can use. The Enforcer-aware CodePRobe debugger offers an excellent two-window source debugging environment, and contains support for library and multi-task debugging.

SAS/C offers the option-strict ANSI compliance, or K&R looseness, but defaults to a sort of relaxed ANSI mode. The SAS implementation also offers many Amiga-specific extensions, such as direct library calls (for OS functions with registered and taglist parameters), Chip RAM allocation, forced data alignments, and conventions for use from Assembly or Amiga library/device programs.

The C++ language is taken from Bjarne Stroustrup's The C++ Programming Language, Second Edition, with the omission of templates, exceptions, and member pointers in virtual base classes.

I can certainly recommend SAS/C – I use it myself. It's a mature, well-designed development system for the advanced or professional programmer. Using C on the Amiga is easy, since it has the most support of any language, being used by the Commodore-Amiga software development team.

DevPac 3

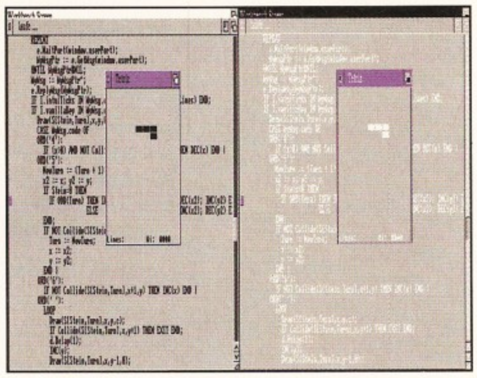
At one time in history, if you really programmed, you used Assembly, the computer's native human-readable language. High-level languages are more popular, but there is still a place for Assembly. DevPac 3 (HiSoft) is an integrated Assembler Development system. This comes on four disks, two for 1.3, two for 2.x, containing Assembler, editor, debugger, and include files.

The Assembler supports the 68000 through 68040, 68881, 68882, and 68851. It's compatible with the standard Amiga Assemblers, though it has features not found elsewhere. It supports pre-Assembled header files for speed, though it'll handle standard headers. It produces either executable, object, and Motorola S-Record output. The full featured editor integrates nicely with Assembler and the debugger, MonAm.

If you're interested in using Assembly language as a primary language, Devpac 3 is all you need. Its only flaw is the lack of demo code, though it's fairly easy to find such code on most Amiga BBSs, Fred Fish Disks, etc.

Advanced Wirth languages

Niklaus Wirth released Modula-2 in 1982 as an answer to the deficiencies of Pascal. It includes facilities for managing modules, abstract data types, procedure variables, and low-level programming facilities necessary for the implementation of operating systems and other machine-specific jobs. In 1986, Wirth defined a new language, this time the Oberon



A+L Amiga Oberon is an excellent – and fast – development system.

language, which addresses a number of problems with Modula-2, specifically the incorporation of fully abstract data types, or objects. In addition to the object-oriented features, Oberon is also streamlined, removing some lesser used features of Modula-2.

Benchmark Modula-2

Benchmark Module-2 (Avant-Garde Software) is a full Amiga Modula-2 Development System. Numerous modules are supplied, for Amiga interface and other functions, but do not access AmigaOS features beyond 1.3. The complete system as supplied occupies eight disks, and included is a book that teaches Modula-2. It consists of a MicroEmacs based editor, a compiler, linker, and debugger.

The editor delivers an integrated system, but unfortunately, it's OS 1.3 heritage shows; it can't use a large Workbench screen, and has trouble with user-defined system fonts. The compiler is fast and works well from the editor. The debugger has some nice features, including a better windowed interface than most I have used, but it didn't work properly on a 68040 system. It's the same throughout – it's a nice system, sorely in need of an update.

A+L M2 Amiga

M2 Amiga (A+L AG, Switzerland) is another Modula-2 system. It comes compressed on three disks, with a loose-leaf manual. The manual is good, but doesn't teach the Modula-2 language. M2 Amiga comes with compiler, linker, project management tools, editor, loader, Amiga interface modules for OS 2.04, demo programs, and other bits and bobs.

Like some C compilers, it handles registered parameters and direct library calls. It supports BCPL pointers as a built-in type, so no explicit conversions are necessary to use these pointers. The text editor is based on MicroEmacs, and supports large screens, ASL file requesters and good online help.

You can't compile from the editor, but it does know Modula-2 indenting rules. The supplied project manager and make utility automatically handle module dependencies in large projects. A loader tool supports an incremental linking scheme which speeds up development; only modules that change need to be linked when this is used. Finally, there's a source-level debugger for bug-swatting.

This is a very good Modula-2 system. It's fast, easy to use, Amiga-friendly, and pretty much up-to-date with the current operating system. The only real problem I had with it is that a few pieces have yet to be translated into English. The English documentation appears to be a bit behind the actual implementation – for example, the latest compiler has switches for every 680x0 processor and FPU (presumably for CPU-optimised code), but there's no mention of it in the manual.

Turbo Modula2

Turbo Modula2 (by Amritpal Mann) is a freeware Modula-2 compiler, with precompiled modules for AmigaOS 3.1 and some ANSI-C standard functions. It will run under AmigaOS 1.2 or later in 1Mb or more. Rather than supply its own linker, the CLI-based system provides a linker front-end that actually calls the freeware DICE compiler and linker for linking. The freeware version limits the size of a module pretty severely, but a main program can be large. The full, registered version is £25.

A+L Amiga Oberon

Amiga Oberon V3.00 (A+L AG, Switzerland) is an Oberon development system. This comes on seven disks, and is backed by a large manual, which is a complete description of the system, but does not try to teach Oberon. The large system includes a smart make utility and a linker, a nice source-level debugger, and modules to interface with AmigaOS routines up through OS2.1 (source included).

There are 68020+ specific versions of most of the tools, to speed up development times. Extra modules include a startup system with optional dynamic garbage collector, lists (linked, queues, stacks), trees (AVL, Binary), conversions, easy Amiga functions (audio, graphics, requesters, etc.), enhanced types (dynamic strings, dynamic arrays, complex numbers, long sets and integers, vectors, etc.), and other bits and pieces.

The multi-buffer editor supports AREXX and standard file and screenmode requesters. Compiles, links, and makes can be run from the editor, and the whole thing is very flexible and configurable. The compiler itself implements a small superset of the Oberon language. It transparently handles BCPL pointers, it supports a C/Assembly-compatible STRUCT in addition to Oberon's type-protected RECORDs, and it can make direct AmigaOS library calls.

This is an excellent development system. It adheres to Amiga standards, works on all systems, it's fast and comes with a good support library. The only problem is the current lack of English documentation and localisation support.

Oberon-A

Oberon-A (by Frank Copeland) is a superb freeware Oberon-2 compiler, distributed under the GNU General Public License. It includes interface modules for AmigaOS 3.1, plus extra modules for easier application development,

39 strings, lists, buffered I/O, AREXX, etc., along with the sources to the whole system. While the compiler and program management tools run only from the CLI, a simple environment manager called FPE is provided, which is very easy to use. There is no editor provided; FPE uses Commodore's MEmacs by default.

This is a commercial-quality system by all accounts. Extensive documentation is provided in AmigaGuide format for the compiler, other system tools, interfaces, libraries, examples, and Oberon-2 in general, including several papers from ETH, the home of Wirth and Oberon. The Oberon-2 language is extended to support direct Amiga library calls and C-style pointer variable and code interfaces. The example code included generic Oberon from ETH, translations of ROM Kernel Manual examples, and Public Domain sources.

The compiler is fairly fast, and ran without any problems. Even with the garbage collector included, compiled programs are reasonably sized. As distributed on the Fresh Fish CD-ROM, most of Oberon-A can be run in place, but it's much slower than from hard disk. I recommend this system to anyone interested in Pascal, Modula-2, or Oberon programming.

Special languages

The languages covered so far are designed, for the most part, as general purpose programming languages. These are the workhorse languages. There are times, however, when any programmer may find that one of the many special purpose languages better suits a particular job.

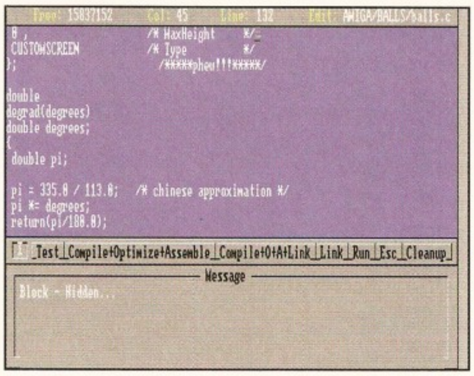
Mathematics languages

Most high-level languages can do some kind of floating-point mathematics. Some specialised languages have become known for "number crunching", based on their available function libraries, their powerful operator sets, or their ability to define just how an operation will take place. Even C language can not always replace this kind of language.

Absoft FORTRAN-77

FORTRAN (for FORmula TRANslation) is the oldest language still in use, designed in 1956 for solving mathematical problems on 'batch processing' computers fed by punched cards. Absoft FORTRAN-77 Version 2.2 (Absoft, Inc.) is an implementation of the ANSI standard FORTRAN-77 language, with extensions for subprogram recursion and Amiga library support. It comes on a single disk with a binder manual containing about 70 pages for Amiga specifics, and several hundred on the generic system, including compiler, debugger, linker, and librarian. The manual fully describes the language, but does not attempt to teach programming.

I ran across a few problems. The examples and compiler, possibly due to the overlay system used for both (code is often linked to access the FORTRAN library as an external module, saving much space if you have the system installed on your machine), caused



Can't we have a pretty picture now? Once you've seen one of these screens...

crashes and unexplained failures with the MC68040, though these went away when the caches were off. There also seems to be a 'DF1:' hard-coded in the library search path, which is a problem, but not a great one, since it looks for libraries in the current directory first. If you're using a 68040 system, check with Absoft for their official word on '040 compatibility.

Amiga APL II

APL was invented by Dr. Kenneth Iverson, and first published in 1962. Unique among computer languages, it wasn't designed as a computer language, but rather a formal means for expressing mathematical procedures. One result of this is that APL has a unique and cryptic character set. APL.68000 (MicroAPL, Ltd.) is an APL interpreter for the Amiga. It is actually available in two versions, Level I and Level II (V2.05F), the latter being the most interesting. It comes on a single floppy, with Amiga-specific documentation, a well-written, several-hundred page manual on the language itself, a quick-reference guide, and keyboard labels for the special symbols APLs uses. You can learn to program in APL from the manual.

The Level II package includes two versions, a plain 68000 version and an FPU-based one, while no FPU support is available in Level I. The APL interpreter starts up a "workspace", which is a set of functions and variables kept as a set. They can be saved to disk, and merged or loaded from disk. Start-up from Workbench tends to grab most of the system's memory for APL, but on the command line the desired amount can be specified. Multiple sessions can be run from APL using the same copy of the APL interpreter. There is support to call Assembly routines, and a number of Amiga-specific functions to manage menus and windows, graphics, I/O, sounds, multitasking, and event trapping.

I think APL.68000 is the right tool for certain problems. If your reason for programming is interactive 'number crunching', it would be hard to find a better language. The lack of a direct AmigaOS interface is a problem if you're trying to build complicated applications. The only complaint I have is that the windows are fixed at about 640x350 and don't support large fonts. This is also a good system for learning, though you'll miss some of the power of APL if you learn it and later move to something else.

Advanced script languages

A script language is specialised for command shell programming. Any program you can run within an Amiga Shell (CLI) becomes a command in a script language. Simple shell scripts, like the Amiga's built-in CLI processor (used for Startup-Sequence) use nothing but shell commands as their language. More advanced scripting languages combine a set of built-in processing capabilities that combine with the Amiga's Shell commands to create a very powerful facility for writing 'quick and dirty' programs.

AREXX

AREXX (included in AmigaOS 2.x/3.x) extends the Shell script concept of building new applications by linking old ones together. It can easily access the Shell level, just like any scripting language, and it has its own execution environment, with recursive subroutines, typeless variables, and a variety of built-in functions for powerful string processing. Amiga shared libraries can be accessed by AREXX, so it can be used as a first-class programming language as well as a scripting language. While the standard AREXX in AmigaOS is interpreted, compilers are available.

Where AREXX really shines, though, is when coupled with other programs that are designed to work as hosts and clients. Programs can export commands that can be addressed from AREXX in much the same way AREXX runs Shell commands. In a sense, any application that supports AREXX adds to the AREXX command set.

Programs can also use AREXX as their scripting language in this way, eliminating the need for each program to have a different language for managing "macros". Every Amiga user is a potential AREXX programmer, since AREXX support is very common in both commercial and freeware applications. It's even more important to programmers, since many development tools can use AREXX, it's a good way of prototyping new applications, and there's a good chance that any commercial Amiga programmer will want to add AREXX support in any new program.

So, in summary...

Hopefully this has been a useful guide to the selection of a programming language. Your choice of computer language will colour your whole computing experience, especially if you get serious about it. The languages available on the Amiga, while hardly a sample of all the world's languages, are pretty representative of the set of all languages.

Language development is never purely static, but has become reasonably stable in recent years, so your language of choice is probably a sound investment. The most influential factors of recent times have probably been objects, found in the Amiga's Datatypes and BOOPSI subsystems, as well as C++, E, and other languages. ■

Language comparison chart

	ACE	Amiga	Amiga E	AMOS Oberon	L2 APL Pro	AREXX 68000	Bench-	Blitz Mark M2	Devpac BASIC	F- 3	Fortran Basic	HiSoft 77	HS Basic	J- Pascal	M2 FORTH	Oberon Amiga	SAS A
C/C++																	
Distribution:	Free	Free	Com	Com	Com	Com	Com	Com	Com	Com	Com	Com	Com	Com	Com	Free	Com
Memory:	512K	512K	1.5M	1M	512K	512K	512K	1M	512K	512K	512K	512K	1M	512K	512K	1M	1M
System Overview:																	
System Type Compiler	Yes	Yes	Yes	Yes:O	No	Yes:O	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes(2)	Yes	Yes	Yes
Interpreter	No	No	No	Yes	Yes	Yes	No	No	No	No	No	No	No	Yes(2)	No	No	No
Assembler	Yes	Yes	No	Yes:O	No	No	No	Yes	Yes	No	No	No	Yes	Yes	No	No	Yes
Interface																	
CLI	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Workbench	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
AREXX	No	No	Yes	No	No	---	E	No	No	No	No	No	No	No	No	No	Yes
Editor	No	Yes(10)	E	G	F	No	G	F	G	F	No	Yes	G	G	G	No	G
Integrated	Yes	Yes(10)	E	E	Yes	No	Yes	G	G	G	No	E	E	G	No	No	G
User Level																	
Learning	E	F	F	E	E	G	F	G	P	G	P	E	G	F	F	F	F
Advanced	F	E	E	G	E	E	G	G	E	E	F	G	E	E	G	E	E
Development	P	G	E	F	F	E	G	G	E	G	F	F	E	E	E	E	E
Special	P	F	G	P	E	G	P	P	P	G	G	F	F	G	P	P	F
OS Provided by Amiga operating system interface only. Note that any language supporting AmigaOS calls can use this level of interface. --- Unknown or not applicable to this package/language. E The featue is Excellect G The featue is Good F The feature is Fair P The feature is there, but minimally or poorly Yes The feature exists No The feature does not exist																	
Execution/Code:																	
Production																	
Stand-Alone	Yes	Yes	Yes	Yes:L	Yes:OL	No(4)	Yes	Yes	Yes	Yes	Yes:L	Yes	Yes	Yes	Yes	Yes	Yes
Executable	Yes	Yes	Yes	Yes:O	No	Yes:O	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
ROMable	Yes	Yes	Yes	No	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Object Code	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes
Optimizer	No	Yes	No	No	No	No	No	No	Yes	No	Yes	No	No	No	No	No	Yes
68020+	No	No	Yes	No	No	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	Yes
:O Available as an option purchased separately :L Run-time distribution requires licensing.																	
Floating-Point																	
Custom/Unspecified	No	No	No	No	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No	No	No	Yes
FFP.library	No	No	Yes	Yes	No	No	Yes	Yes	No	No	No	No	No	Yes	Yes	Yes	Yes
IEEE.library	Yes	Yes	Yes	Yes	No	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	Yes
Direct FPU	No	No	Yes	No	Yes	No	No	No	Yes	Yes	Yes	No	No	No	Yes	No	Yes
Language Features:																	
Standard	Yes(3)	No	Yes	No(3)	APL2	Yes	Yes	No(3)	Yes	No(3)	ANSI	Yes(3)	Yes	Yes	Yes	Yes	ANSI
Data Types																	
Typing	S	W	S	M	W	W	S	S	W	S	M	S	S	W	S	S	S(5)
Lists	No	G	F	No	F(6)	No	No	F	---	No	No	No	No	No	No	F	No
Arrays	F	F	G	G	E	No	P	F	---	G	G	G	F	F	F	F	F
Text	F	F	F	G	G	E	F	G	---	E	P	G	G	P	F	G	G
User-Defined	No	E	E	No	No	No	E	G	---	E	G	No	E	G	E	E	G
S Typing is strong M Typing is moderate W Typing is weak																	
Subprograms																	
Macros	No	Yes	No	No	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No	Yes
Line	Yes	No	No	Yes	No	No	No	Yes	Yes	Yes	No	Yes	No	No	No	No	No
Procedures	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Functions	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Operators/Overload	No	No	Yes	No	Yes	No	No	No	No	Yes	No	No	No	No	No	No	Yes
Recursion	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Level																	
Structured	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Modular	No	Yes	Yes	No	No	No	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Object-Oriented	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes	No	Yes	Yes
Supplied Interfaces:																	
Graphics																	
Animation	F	OS	OS	E	No	OS	OS	E	OS	G	OS	G	OS	G	OS	OS	OS
IFF	No	OS	G	E	No	OS	G:O	G(8)	OS	F	OS	G	OS	F	OS	OS	OS
Intuition/GUI	G	OS	F	E	F	OS	G:O	G	OS	E	OS	F	OS\tab G	OS	OS	OS	
2-D Drawing	E	OS	F	E	F	OS	OS	G	OS	G	OS	G	E	F	OS	OS	OS
3-D Drawing	No	No	No	G:O	No	No	No	F(8)	No	No	No	No	No	No	No	No	No
Sound																	
Simple	G	OS	F	E	G	OS	OS	G	OS	G	OS	G	OS	OS	OS	OS	OS
IFF	F	OS	OS	E	OS	OS	OS	G	OS	F	OS	OS	OS	OS	OS	OS	OS
Tracker	F	No	No	Yes	No	No	No	Yes	No	No	No	No	No	No	No	No	No
MIDI	No	No	No	Yes	No	No	No	Yes(8)	No	No	No	No	No	No	No	No	No
Other																	
OS/Library Calls	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Amiga Interface	3.0	3.1	2.1	2.x	1.3	No	1.3(4)	2.x(9)	3.0(1)	3.0	1.3	3.1	2.x(1)	2.x(1)	2.x	3.1	2.x/3.x(1)
Call to Assembly	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	---	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Call from Assembly	No	Yes	Yes	No	No	Yes	Yes	Yes	---	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AREXX	OS	OS	Yes	Yes	No	---	OS	Yes(8)	OS	Yes	No	OS	Yes	OS	OS	OS	OS
Event Trapping	No	E	F	F	F	F	No	G	OS	G	No	Yes	No	F	F	F	F
C Courses D Extra example disks L Newsletter M Freely redistributable disk "magazine"																	
Tools/Support:																	
Debugger																	
Type	---	---	RDB	RDB	ENV	ENV	RDB	PDB	RDB	RDB:O	RDB	RDB	RDB	ENV	PDB	---	RDB
Trace	---	---	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	---	Yes
Breakpoint	---	---	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes(7)	---	Yes
Variable	---	---	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes	---	Yes
Expression	---	---	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No	No	Yes	No	---	Yes
Source	---	---	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	---	Yes
ENV Debug features are mainly consequence of the interpretive environment. RDB Separate run-time debugger provided. PDB Separate post-mortem debugger provided.																	
Installation																	
Automated	No	No	No	Yes	No	No	No	No	No	No	No	Yes	No	Yes	No	No	Yes
Floppy	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Flexible	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Help/Learning																	
Manual	F	F	G(D)	E	G	G	G	G	E	G	F	G	E	G	G	E	E
Tutorial	No	No	No	G	F	No	F	No	No	No	No	No	No	F	No	No	No
On-Line Help	F	F	No	E	P	No	No	No	No	No	No	Yes	No	No	G	E	E
Extra Tools	F	G	E	E	No	Yes	G	No	G	P	F	No	F	G	E	G	G
Example Code	G	F	G	E	P	F	E	E	P	G	G	G	F	G	G	E	G
Phone/FAX	No	No	Yes(CH)	Yes(GB)	Yes:O	---	Yes	Yes	Yes:O	Yes	No	Yes	Yes:O	Yes	Yes(CH)	No	Yes
Vendor BBS	No	No	No	No	No	No	No	No	Yes	No	No	No	Yes	No	No	No	Yes
Other Support	No	No	No	M	C(GB)	No	No	D,L	No	No	No	No	No	No	No	No	No
User SIG	No	No	Yes(D)	Yes	Yes	No	No	No	No	No	No	No	No	Yes	Yes(D)	No	Yes

(1) AmigaOS interface routines can be generated ".fd", ".h", ".i", or other files distributed by Commodore as a standard part of their OS support releases. (2) Incremental compiler, exhibiting features of both interpreter and compiler. (3) There is no true standard for BASIC, though on the Amiga the AmigaBASIC language is the effective standard. All of the reviewed BASIC languages are very recognizable as BASIC, and it's usually not too difficult to convert from AmigaBASIC to any of them. (4) BenchMark M2 comes only with AmigaOS 1.3 support. A set of 2.04 DEFINITION modules is available from Aglet Software, PO Box 3314, University Station, Charlottesville, VA 22903. (5) SAS/C is by default strongly typed, but compiler options allow it to support the moderate type enforcement typical of pre-ANSI C languages. (6) APL doesn't implement lists is the classic LISP sense, but a manipulations on its dynamically reconfigurable string arrays achieve some of the same things. (7) Breakpoints work by explicitly inserting breakpoint functions which in turn envoke the post-mortem debugger. (8) Functions available in modules supplied with Issue 2 of the Blitz User newsletter. (9) The standard system includes AmigaOS interfaces for Exec, DOS, Graphics, Intuition, and Diskfont libraries. A full Amiga system interface set is available as an option. (10) The integrated editor is a test version, not fully functional.

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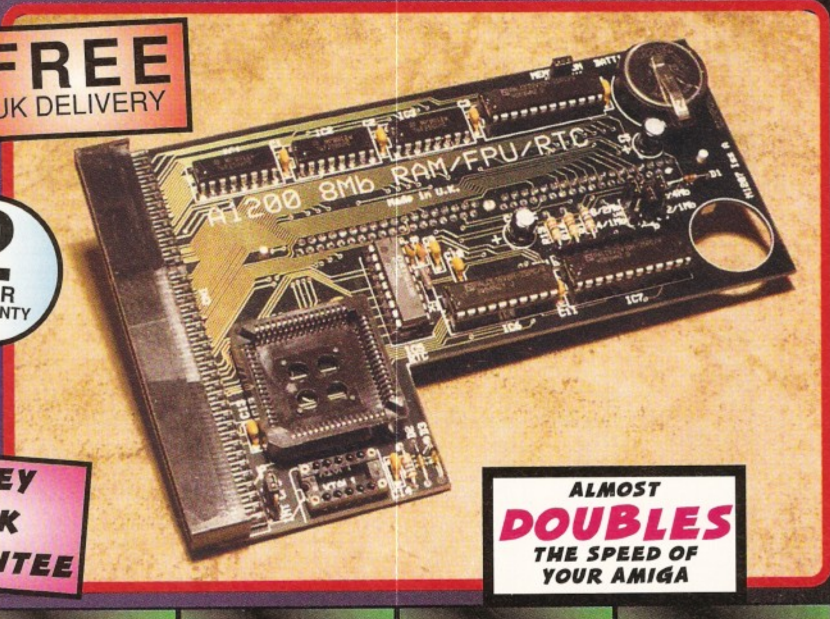
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video Reviews

What stars! **Gary Whiteley** *evaluates two new CD-ROM collections aimed at the Amiga desktop video enthusiast. He also takes a look at Lola Electronic's brilliant new custom Chip L1500 composite genlock.*

When you've finished reading these reviews, turn to page 68 where Gary has also answered some of your most frequently asked video-related questions. You should find a solution to any problems you're having with your video set-up there.

VideoWorld Nexus Pro CD-ROM

Following on from the critically-acclaimed Nexus Pro Background disks, VideoWorld have put together a solid set of 300 new images, plus the original 150 backgrounds in three different display formats (GIF, 256HAM and JPEG 24-bit), along with 470 scaleable PD Compugraphic fonts, 100 sound effects and music loops and a small collection of useful PD display and other utilities.

The Nexus Pro CD-ROM appears to be perfectly-suited to the professional Amiga DTVer, particularly with Scala MM applications. Almost all of the images are of excellent quality and cover a wide range of topics, from natural objects, textures and travel scenes, to wedding shots, with many of them suitable for use both as backgrounds in DTV work, or texture maps in 3D applications. As professional DTV producers themselves, VideoWorld have drawn on their own experience, so most of the images are in PAL overscan formats, ready for use without any resizing. To provide a wide range of images, photographers were commissioned on several continents and the resulting scans and PhotoCD images are top notch.

To make life easier, catalogues of mini-images are provided on the disk, although no reference prints are available as hardcopy. The biggest drawback here is that the latest images don't have descriptive names, just a numbering system, so, unless you refer to the catalogue images, you have little idea of exactly what you'll be loading. The original Nexus Pro background images have descriptive titles, but these are too long to reproduce correctly on PC or Mac systems, which is why I suspect that VideoWorld have changed to a numbering system to make the disk more attractive to non-Amiga buyers.

More conveniently though, prints *are* provided for each of the 470 PD Compugraphic fonts (for use with WB2.04 or later Amigas) on the CD. These are mostly derived from PD Postscript fonts which have been converted to the more widely useful CG format.

The hundred sound and music effects are all professionally sampled and engineered and, thus, of very high quality. As a consequence, some require over 1Mb free memory for playback, so you'll really need a well-specced Amiga to make the best of this collection. Fortunately, the PD directory utility supplied (DirWork 2.1 demo) can play these sounds and loops back, so don't be concerned if you don't have any music software.

There're plenty of handy PD utilities here, including several image viewers, though most of them are here more for convenience than because they are fantastically useful, with the exception of programs like Viewtek, Rend24 and DirWork.

Overall, the Nexus Pro Reference Library CD is a professionally prepared and directed collection targeted mostly (though not specifically) at the professional and semi-professional Amiga desktop video user who wants to produce classy-looking images and text with the minimum of fuss. The sound effects are a great bonus, and the PD utilities help keep everything under control.

One small problem, however, is that some of the JPEG images haven't made it into PAL overscan format. VideoWorld were concerned to hear about this, and admitted that it hadn't been possible to check every image thoroughly, though they pointed out that it wasn't the end of the world and that the Rend24 PD utility supplied on the CD-ROM was capable of resizing images.



All 3D fans should enjoy the wide selection of Public Domain and demo objects available on the DTV CD in Imagine, Lightwave and Sculpt formats.

Using these CD-ROMs

To get the very best out of either of these two CD-ROMs, you'll need an AGA or 24-bit equipped Amiga, as well as 2Mb, or more, of memory to display the larger 256-colour or JPEG images.

Additionally, a video titling program (such as Scala) and image processing software (ADPro, ImageFX or Photogenics) will be very useful. For the full video effect you'll also need a genlock and some video equipment, though this isn't necessary to run most of the PD software on either disk, or to just output images to tape if you have an Amiga with a video output or a modulator attached.

As well as being used as video or other DTV backgrounds many of the images can be used as textures in 3D rendering and animation, which is particularly useful when you consider that the Almathera CD also provides a host of 3D objects.

Nexus Pro Reference Library CD-ROM

Price: £50 (inc p&p)
Supplier: VideoWorld Multimedia
Contact: 0141 641 1142
System requirements: Amiga with CD-ROM drive. Recommended – 2Mb, or more, RAM, hard drive, 24-bit display card or AGA Amiga.
Verdict: 90% **Star buy**

Almathera Amiga Desktop Video CD

Although its title suggests that the contents are specifically DTV-oriented (there *are* plenty of DTV images, graphics, fonts and programs in this collection), there are also lots of PD utilities and objects which have more to do with 3D than DTV.

Like the Nexus CD-ROM, the Almathera DTV CD contains a wide range of images in a variety of useful formats. However, many either aren't in an overscan format, or are of rather middling quality. In fact, some of them are downright awful, especially



The clip art images are probably some of the best on the Almathera CD, though I've no idea how much use they'll be to most folks.

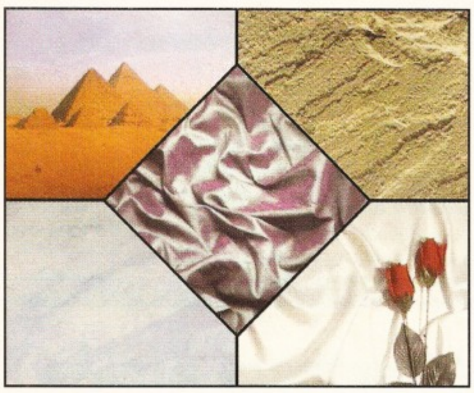
the Food and Flag images. Things are much better on the font side, boasting many and varied fonts. It would be hard to find a better collection at this price.

Although the DTV CD doesn't have any sounds, it does have a fairly large collection of 3D objects – in three popular formats, namely LightWave, Imagine and Sculpt (for Real3D users). Whilst there is quite a lot of old stuff here, there are some excellent Viewpoint demo objects and plenty of others which could usefully be adapted. Like much of this CD-ROM's contents, many of these objects are shareware or have copyright restrictions, so be prepared to pay if you use them.

As for PD utilities, there is a wide range of PD and shareware programs: some demos – some a bit crusty and not all particularly useful, but, again, for the price, it certainly saves on the old 'phone bills. However, some of the 3D software (in particular PoV) requires a well-specced Amiga and an intelligent mind to get going.

A shareware version of DirWork (v1.62) is included, as are some basic video titling and applications software, a number of PD image processors and generators and quite a few viewers and other applications.

On the down-side, many of these programs are poor substitutes for their commercial counterparts, but, then, they are a lot cheaper than them too.



The Nexus Pro CD-ROM provides over 450 excellent-quality images and textures in a variety of formats, which cover a wide range of subjects suitable for many different DTV, graphic and 3D applications.

Amiga Desktop Video CD

Price:	£14.95
Supplier:	Almathera
Contact:	0181 687 0040.
Verdict:	**75%**

L1500 Genlock

Lola Electronics certainly haven't been resting on their laurels since they first re-launched their excellent, budget-priced MiniGen genlock. Then, there was the MiniPro (aka L1000), and the L2020 and 4020 encoder cards to provide YC, composite and RF outputs from A2000 and A4000 Amigas, and now they've produced their next-generation genlock, the L1500, based around Lola's new baby – the Lola 1452-01 Custom Genlock Chip.

The size of a large paperback, the L1500 has three push-button selection switches (for Key On, Key Off and Bypass), plus two sliders to determine the mix of Amiga graphics over video and to fade the whole video output to and from black. Rear connections are two professional-style 75 Ohm BNC connectors for composite video input and output, a 15 pin connector to interface the L1500 with the Amiga's RGB output (a two foot long 23 pin to 15 pin cable is supplied), 23 pin RGB output for pass-through to your normal RGB monitor and a 9 pin connector, marked Chroma Key, for connecting the L1500 to Lola's coming Chroma Key unit.

The whole package looks and feels good, and the buttons and switches are all high quality components. Two Phono/BNC adaptors and a small screwdriver are also included in the package, so the only thing you need to supply are two suitable input/output cables, the Amiga and the video equipment.



Pic: Jonathan Fisher Photography

Setting up the genlock is simple – video in from any suitable composite video source, video out to VCR, digital disk recorder, or direct to monitor if no VCR is to be used, Amiga RGB to L1500 and L1500 RGB to Amiga RGB monitor. The drawback of not having an external power input could be that any overloading of the Amiga's power supply might cause genlocking problems.

In operation, I found the L1500 to operate extremely well, even with a relatively poor VHS tape that I like to keep for really putting such equipment through its paces. The input video signal remained good throughout the genlocking process and the genlocked graphics stayed crisp and colourful at all times, with none of the fuzzy edges, colour creep or delay shadowing which occasionally appears with some of the other genlocks in the L1500's price bracket.

Even without an incoming video signal, the L1500's video output remains stable and usable, thanks to the 1452-01 Chip. To top it all, I was pleased to see that the L1500 operates correctly in full overscan and, unlike some other genlocks, doesn't leave a line or two at the top of the screen where the incoming video remains unmasked at all times – a veritable pain when you're using full screen transitions and graphics.

The switching buttons work cleanly and no discernible glitches occur when another selection is made. Both the sliders are very smooth and fading takes place over their full range, making for consistent fades to black and Amiga/Video crossfading.

I do have two minor gripes though. The first is that my Amiga's RGB screen became slightly quivery when the genlock was connected to my system, though I didn't find it too objectionable. The second is that, whilst the L1500 actually works successfully with my OpalVision card (which is in itself something of an unexpected bonus), the colour saturation was, in this case, slightly down, leading to paler colours in the genlocked graphics. However, since Lola probably didn't design the L1500 to work with the OpalVision in the first place, then I shouldn't be too critical on this point, since the L1500 works fine in all other circumstances.

For both home DTV and semi-pro video work I would have no hesitation in recommending Lola's L1500 genlock as a worthwhile and value-for-money piece of kit which provides great quality composite genlocking with the minimum of fuss or problems.

If you're in the market for a genlock, or are looking to improve on what you've already got if you're still using a cheaper or older model, then the L1500 is well worth investigating. ■

Genlocking

In computer parlance genlocking usually ends up meaning the overlaying of graphics on to an incoming video signal.

Technically though, genlocking refers to the process of synchronising one piece of video equipment (in this case the Amiga) to a video signal in order to seamlessly combine their outputs together in various ways.

Only true video signals such as composite and S-Video can be genlocked – the RF (or modulated) signal which runs down your TV aerial and is used to connect your VCR to a TV is not suitable for genlocking.

Lola L1500 Genlock

Price:	£176.25
Supplier:	Lola Marketing Limited
Contact:	01858 433501
Verdict:	**93%**

Amiga Shopper Star buy

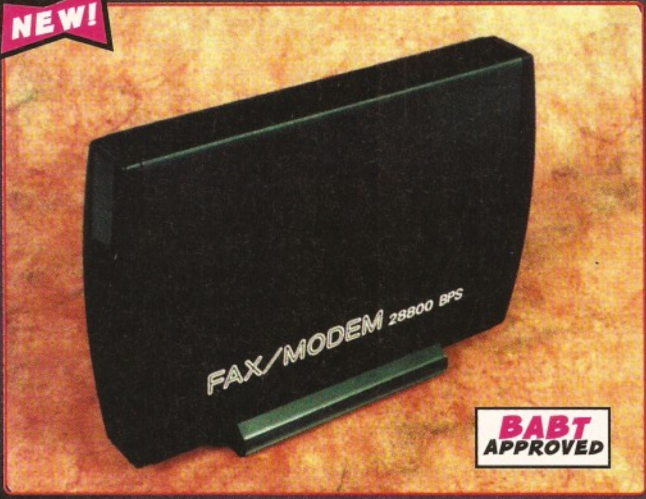
Gary Whiteley can be E-mailed at drgaz@cix.compulink.co.uk.

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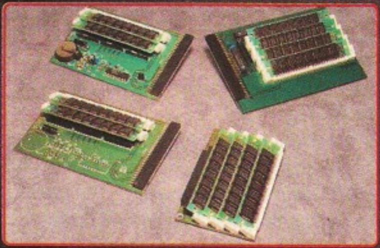
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LightWave plug-ins

LightWave is an incredibly powerful package, but it can be made even more powerful thanks to a range of add-on programs. **Graeme Sandiford** *guides you through the products now arriving in the UK.*

LightWave is certainly one of the most powerful and easy to use 3D animation and rendering packages available. You may find this hard to believe, but LightWave's 3D-prowess can be enhanced to produce even more fantastic results by using add-on tools.

Leo Martin's Surface Pro

No matter how good a modeller you are, no matter how many hours you spend, or how complicated a model you produce, it can always be improved with skillful texture-mapping. Getting the surface of an object just right can bring added realism, accentuate its shape and provide extra detail.

However, getting it just right takes time and requires a certain amount of experience. Thankfully, Leo Martin seems to possess the relevant experience and has put in the effort to produce some absolutely stunning surfaces.

Once Surface Pro has been installed, you'll find several new files in your images, surfaces, scenes and objects directories. Within these are SP directories that contain Surface Pro's files.

The obvious directory for you to start experimenting with is surfaces. This is full of new surfaces for you to apply to your own objects. They cover almost every surface imaginable, both natural and man-made – there are around 40 unique surfaces and several variations on each one.

As most LightWave-users know, surfaces can comprise several attributes, such as colour, reflectivity, transparency, specular, luminosity and bump maps. This means that the number of combinations that are possible is only limited by your imagination – and good taste, of course.

Obviously I can't describe all of the surfaces, so I'll just mention one or two of them. An intriguing, if somewhat repulsive, surface is the Alien-skin. It's a thoroughly unpleasant combination of colour and bump maps. The effect is pretty good and I imagine that it could be used by school teachers to convince teenage acne sufferers that things could be worse.

The Borg surface, unsurprisingly, makes use of the tech maps textures that have been supplied. The surface resembles that of the Borg ship from Star Trek TNG. This time the appearance of the surface is achieved through the application of a diffusion map as well as a bump map. This is probably the texture that will be used most frequently. The tech map textures have been designed with tiling in mind, so you don't have to worry about sizing them, unless you want to produce a particular effect.

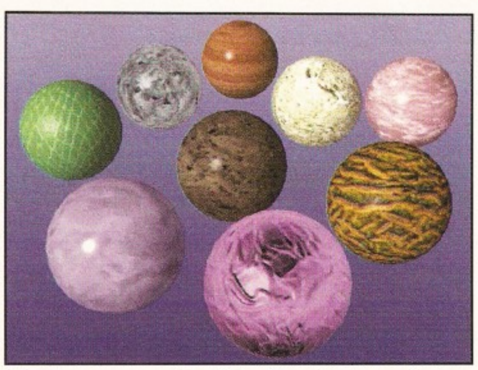
Another surface that is likely to be used frequently is the Fractal-flame. This surface can be used to make surprisingly realistic flames. Even more surprising is its simplicity – it consists of a basic colour, usually warm red, and a transparency map. The surface also includes velocity values so that the flames will appear to flicker during an animation.

A related surface is Sky-cloud. It uses the same texture, called fractal noise, to generate a cloud-like surface. As with the flames, this texture has been given a velocity, but this time the texture moves along the Z axis (with negative value for the clouds to move toward the camera) instead of the Y axis.

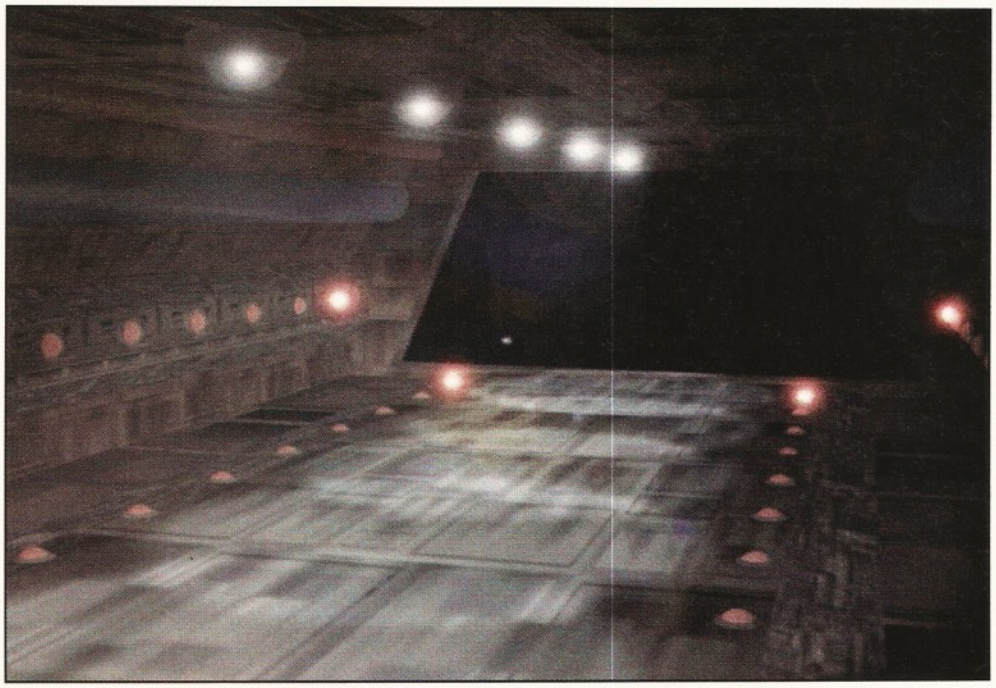
There are quite a few other excellent textures, including several metallic ones, bricks, cork, fabric,

What you need

As with any serious use you put your Amiga to, the more memory and speed you have, the better. To run LightWave you should have about 12Mb of memory, or a bare minimum of at least 8Mb. You'll also benefit from having an accelerator. Don't forget LightWave!



Hers's an example of Surface Pro's surfaces.



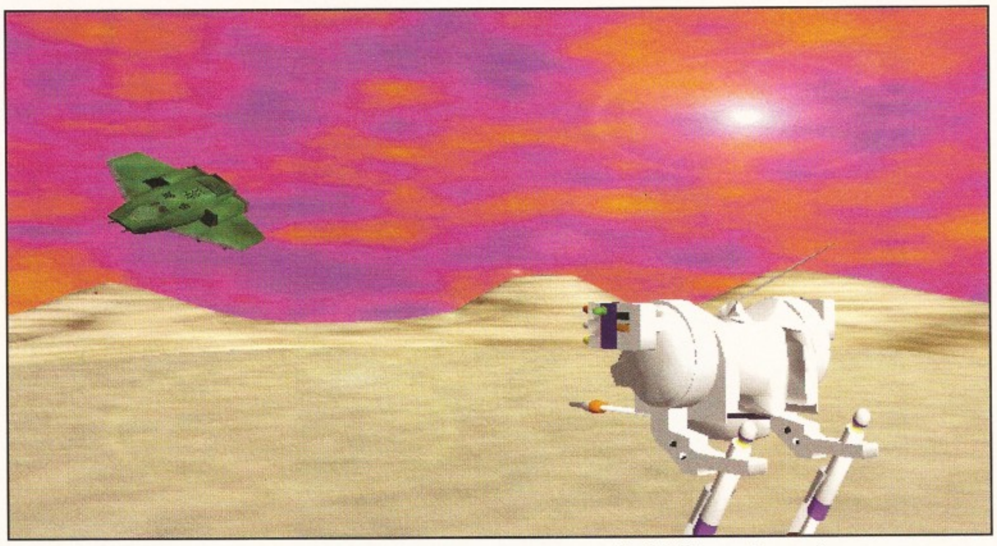
This is just one of the many excellent demonstration scenes that come with Surface Pro.

wood and marble. As well as the surfaces, you can also take a look at the scenes and the objects that are provided. This will give you an opportunity to see how the surfaces can be applied and perhaps even inspire some new ideas.

All in all, this is an excellent collection of surfaces. They are of a high standard and while the subjects they cover are varied, you are likely to find a use for them. A side benefit is that it might improve your knowledge of this part of LightWave, as well as expand the program's functionality. I also feel that £89 is a fair price for the surfaces and the lessons you learn from them.

Surface Pro

Price: £89
Supplier: Premier Vision
Contact: 0171 721 7050
Verdict: 91% **Star buy**



The erratic evasive manoeuvre of the fighter was generated with MouseRecorder.

Motion Master Volume 1

Motion Master Volume I is a collection of four LightWave utilities. As you might expect with a name like Motion Master, they are intended to make certain types of animations more realistic and easier to create. The programs included in this volume are: ExtractAudio, MouseRecorder, PathFlock and TimeMachine.

ExtractAudio

ExtractAudio is an interesting little program that can produce envelopes from IFF samples. Imagine you wanted to create an animation of a talking head using real samples. You would most probably need to morph from one mouth position to another. Of course you would have to get the morph-target envelope spot on – or the mouth would not be synchronised correctly with the sounds. This is fine if you, or your clients, are a fan of the poorly dubbed kung fu movies of the 70s – otherwise you would be sorely disappointed.

ExtractAudio will read amplitude information from samples and then creates an envelope based on that information. In simple terms, what this means is that the program will chart the changes in the amplitude of the sample over time and then save those changes as a LightWave envelope. Once saved, the envelope can be loaded in for use with any of LightWave's features that support the use of envelopes to specify their parameters.

This could include things such as an object's size, position, rotation or a light's intensity. As you can imagine, this opens up all sorts of possibilities; you could have a light that flashes in response to changes in sound, a ball that grows, or a dial or meter that rotates or moves.

In operation, the program is both simple and flexible. You simply load the sample and then decide whether the information should be saved as a motion or an envelope. You can also choose which channel of the motion file the information will be saved (into X position, Heading, Y size etc.).

MouseRecorder

MouseRecorder is the smallest of the programs and performs the simplest task. It records the motion you make with your mouse. However it only records movement on the Y axis – up and down.

This means that it isn't really suitable for choreographing complicated motions freehand. But you can create random or spasmodic fluctuations on an object's position, size and orientation. The best thing about the program is that the changes you make are all performed in real-time.

Pathflock

This is an interesting program with quite a few possible applications. It is intended to be used to create realistic flocking motions for several objects. If you have experimented with creating a scene that involves flocking, such as a school of fish or flocking birds, you'll realise how painstaking this sort of endeavour can be.

Normally, you'd have to key-frame each object, or critter – depending on your mentality, this can take forever, especially if you have quite a few objects you want to flock. This is made doubly difficult when you are trying to make their motions realistic.

Pathflock can load in several objects and then generate flocking motions for each one. These objects will be attracted to a certain point and will therefore gravitate towards it, but in doing so they will avoid crashing into other objects

The operation of this program is a little more complicated and, as with most plug-ins available, it is best run with LightWave. However, it is much simpler and less labour-intensive than key-framing. The results are excellent. By varying the options, such as inter-object stiffness, spacing of the objects and their speed and chaos values, you can emulate anything from a herd of animals to a cluster of heat-seeking missiles.

Looking elsewhere

If you are a regular reader of the, now extinct, Window Shopper section you have seen a number of LightWave tools being reviewed. If not, here's a list of recently reviewed plug-ins and the issues they were reviewed. Turn to page 114 for your back issues order.

Sparks	Issue 42
WaveMaker	Issue 44
PowerMacros	Issue 38
DMM	Issue 41
LightWave Collection	Issue 43, p.19

Other products worth a look at, and soon to be reviewed, are the LightROM (CD) and Lee Stranahan's most excellent series of video tutorials.

TimeMachine

Now don't get too excited, TimeMachine has nothing to do with men with unusually long scarfs who frequent telephone booths. It's best described as a time-line editor for controlling multiple object morphs. It's like an editor that helps you to control how and when the objects in your scene morph.

Morphing is one of the most complicated of LightWave's features and is essential for creating smooth animations. As a reflection of this, TimeMachine is similarly complicated and has the largest area of the manual devoted to it of any of the programs.

Up to 16 objects can be loaded into TimeMachine at one time. Each object is displayed on its own section of a grid and has its level of morphing indicated by a graph. You can add, remove and drag keyframes for each object individually. It also has extensive support for sound and you can load and play samples.

If all this sounds a bit confusing, it is – but after reading the instructions thoroughly you'll soon find yourself morphing with the best animators. Quite simply, TimeMachine is as easy to use as it could be given its awesome power and flexibility.

All in all, this is a mighty fine collection of tools – although I'm still not too convinced about MouseRecorder. My only gripe is that £120 is just a little expensive for this collection. However, I would say that Volume II is almost certainly worth it (look out for a review soon). ■

Motion Master Vol.1

Price: £120
Supplier: Premier Vision
Contact: 0171 721 7050
Verdict: 87%

Survey Reader

Fill in the Amiga Shopper Reader Survey and you could win a copy of the Digita Organiser. But even if you're not lucky enough to win a prize, you will be helping Amiga Shopper to give you what you want...

In order for Amiga Shopper to cover the sort of areas that our readers are most interested in we need to know all about you and your Amiga, and we need to know what you want from your favourite Amiga magazine.

Therefore, we have compiled this survey for you to fill in and send off to us (see the box on page 50 for the address).

And to thank you for your time, we have ten copies of the Digita Organiser to give away, which have been kindly donated by Digita International. The Digita Organiser emulates the printed Filofax-style diary. It enables you to type appointments, birthdays and lists. It also has a full address book, templates and a notepad included. All in all, it's a very useful thing to have.

All about you

1. Are you?
a) ☐ Male
b) ☐ Female

2. How old are you?
a) ☐ 10 or under
b) ☐ 11 to 14
c) ☐ 15 to 19
d) ☐ 20 to 25
e) ☐ 26 to 29
f) ☐ 30 to 39
g) ☐ 40 to 49
h) ☐ Over 50

3. Where do you live?
a) ☐ SE England
b) ☐ SW England
c) ☐ Midlands
d) ☐ NW England
e) ☐ NE England
f) ☐ Wales
g) ☐ Scotland
h) ☐ Northern Ireland
i) ☐ Europe
j) ☐ North America
k) ☐ Rest of the World

4. What do you do?
a) ☐ At school
b) ☐ At college or sixth form (16-18 years)
c) ☐ At uni, poly or higher education (18yrs+)
d) ☐ In full-time employment
e) ☐ In part-time employment
f) ☐ Unemployed
g) ☐ Retired

5. If working, what do you earn per year?
a) ☐ Less than £5,000
b) ☐ £5,000 to £9,999
c) ☐ £10,000 to £14,999
d) ☐ £15,000 to £19,999
e) ☐ £20,000 to £24,999
f) ☐ Over £25,000

6. Please list two of your hobbies (apart from your Amiga, of course):

a) ....

b) ....

All about your Amiga

7. What model of Amiga do you own and how long have you owned your machine? (Please list all of your machines.)

Model	How long owned
a) ☐ A1000	....
b) ☐ A500/A500+	....
c) ☐ A600	....
d) ☐ A1200	....
e) ☐ A1500/A2000	....
f) ☐ A3000	....
g) ☐ A4000/30	....
h) ☐ A4000/40	....
i) ☐ CDTV	....
j) ☐ CD32	....

8. What versions of Workbench are you running on your machine?
a) ☐ 1.2
b) ☐ 1.3
c) ☐ 2.04/2.05
d) ☐ 2.1
e) ☐ 3.0/3.1

9. Is your Amiga usage for:
a) ☐ Leisure
b) ☐ Work (please specify industry sector)

....

c) ☐ Both of the above

10. How much have you spent on your Amiga in the last six months?
a) ☐ Under £100
b) ☐ £100 to £199
c) ☐ £200 to £299
d) ☐ £300 to £399
e) ☐ £400 to £499
f) ☐ £500 to £1,000
g) ☐ Over £1,000

11. How much do you intend to spend on your Amiga in the next six months?
a) ☐ Under £100
b) ☐ £100 to £199
c) ☐ £200 to £299
d) ☐ £300 to £399
e) ☐ £400 to £499
f) ☐ £500 to £1,000
g) ☐ Over £1,000

12. Do you intend to buy a CD-ROM drive in the next year?
- ☐ Yes
- ☐ No

13. Do you own a modem?
- ☐ Yes
- ☐ No

14. If the answer to the above question was no, do you intend to buy a modem in the next six months?
- ☐ Yes
- ☐ No

15. How many PD disks do you intend to buy in the next six months?
- a) ☐ 1-9
- b) ☐ 10-19
- c) ☐ 20-30
- d) ☐ Over 30

16. How do you buy your Amiga products?
- a) ☐ High Street shops
- b) ☐ Local dealers
- c) ☐ Mail order through advertisements in Amiga Shopper
- d) ☐ Through Amiga's Shopper's own reader offers

17. What would you say makes you respond to an advert?
- a) ☐ The size of the advert
- b) ☐ The way the advert looks and stands out
- c) ☐ The price of the products in the advert
- d) ☐ Because you have used the advertiser before
- e) ☐ The length of time that the company has been advertising in Amiga Shopper

18. How important are the following when you buy through mail order (please mark them in order from 1 to 10 – with 10 being the most important)
- a) ☐ The price
- b) ☐ The service and after-sales service
- c) ☐ The amount of times you have seen the advert in past issues

19. If you have used mail order advertisers, was the service:
- a) ☐ Good
- a) ☐ OK
- a) ☐ Bad

All about us

20. How often do you buy Amiga Shopper?
- a) ☐ I subscribe
- b) ☐ Every month
- c) ☐ Usually, but sometimes I miss it
- d) ☐ Only when it looks particularly good
- e) ☐ This is my first ever issue

21. What made you decide to buy this copy of Amiga Shopper?
- a) ☐ I subscribe
- b) ☐ The cover
- c) ☐ The stuff on the coverdisks
- d) ☐ The contents looked interesting
- e) ☐ I only buy it when I can afford it

22. How did you get hold of this copy of Amiga Shopper?
- a) ☐ Subscription
- b) ☐ Planned visit to the newsagent
- c) ☐ Delivered by newsagent
- d) ☐ Reserved at newsagent
- e) ☐ Spontaneous purchase
- f) ☐ This is a friend's copy

23. What's your favourite bit of this issue of Amiga Shopper?
- a) ☐ The cover
- b) ☐ The coverdisks
- c) ☐ The A1200 Tower feature
- d) ☐ The Supertest
- e) ☐ The product reviews
- f) ☐ The interview
- g) ☐ Amiga Answers
- h) ☐ Public Domain
- i) ☐ Tutorials

If tutorials, which ones?

....

....

....

....

24. Rate this issue of Amiga Shopper in terms of value for money
- a) ☐ Excellent value
- b) ☐ Good value
- c) ☐ Reasonable value
- d) ☐ Poor value

25. Out of 10, how much did this month's cover make you want to look inside the magazine?

................/10

26. What do you think of the coverdisks on this new-look issue of Amiga Shopper

a) Coverdisk 1: DICE

....

....

....

....

b) Coverdisk 2: ShopperChoice

....

....

....

....

....

27. Out of 10, how much did this issue appeal to you overall?

................/10

28. What do you like most about this issue?

....

....

29. What do you like least about this issue?

....

....

30. Please indicate how much PD coverage you would like to see in Amiga Shopper
- a) ☐ More
- b) ☐ Less
- c) ☐ Same

31. Which of these other magazines do you buy/read?

	Regularly	Occasionally	Rating
a) Amiga Format	☐	☐	/10
b) Amiga Power	☐	☐	/10
c) Amiga Computing	☐	☐	/10
d) CU Amiga	☐	☐	/10
e) The One Amiga	☐	☐	/10
f) Amiga Action	☐	☐	/10

32. Thanks for your time. If there are any other comments or suggestions you would like to make, please write them below:

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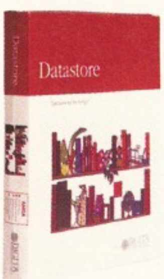
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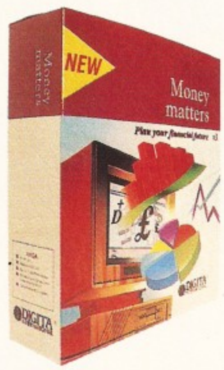
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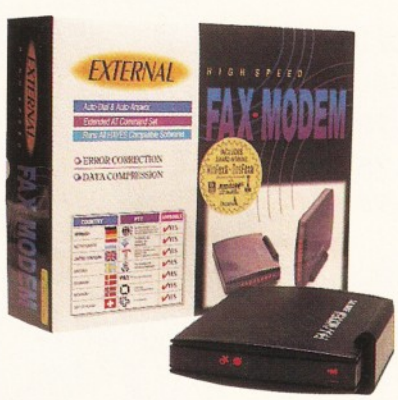


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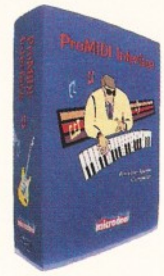
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Description	XL144E Fax Modem
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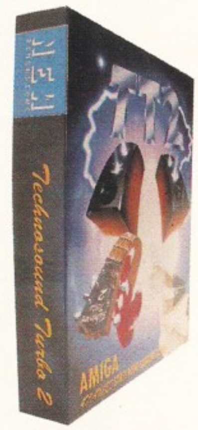


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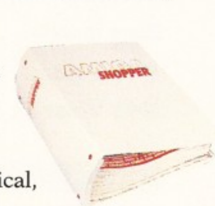
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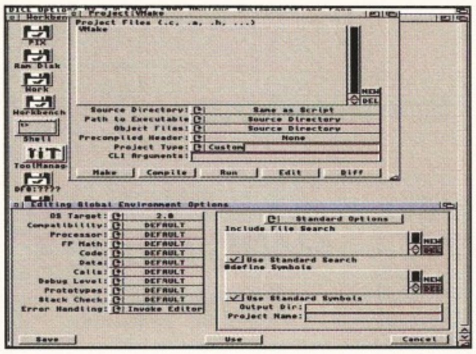
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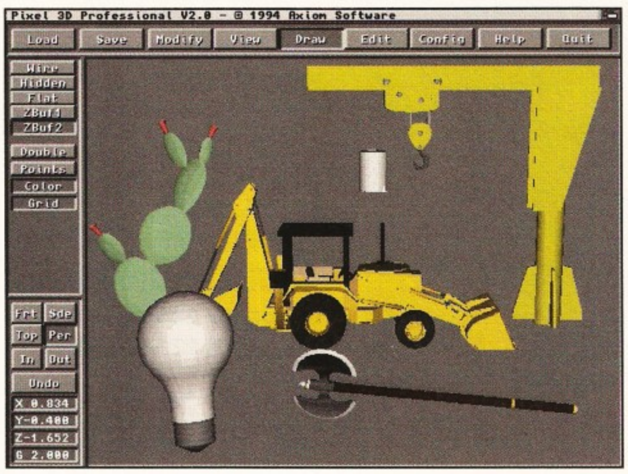


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Description	Pixel Pro V2
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(Black And Colour)

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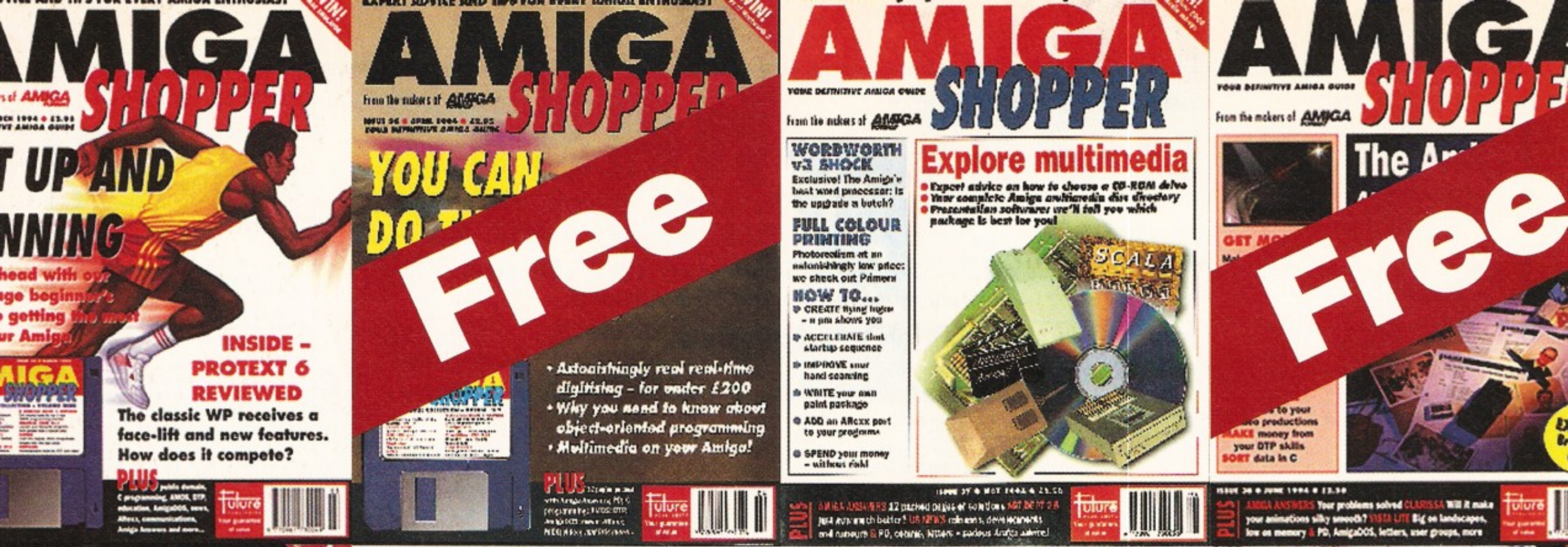
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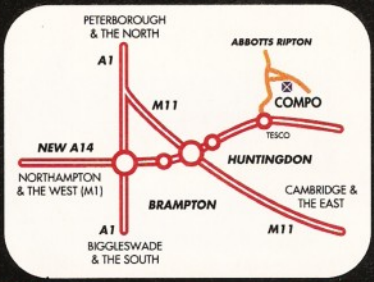
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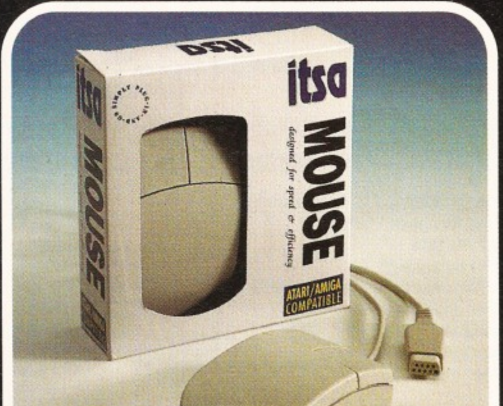


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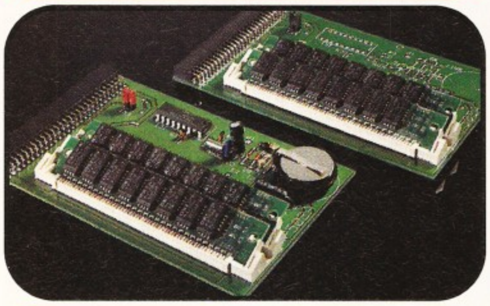
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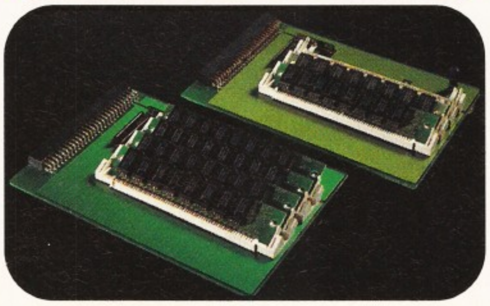
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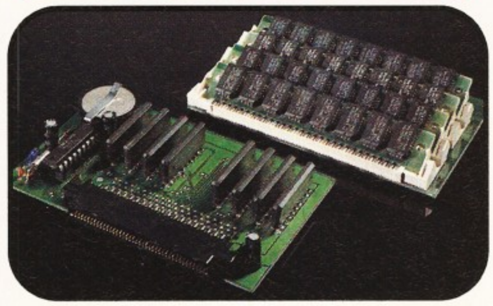
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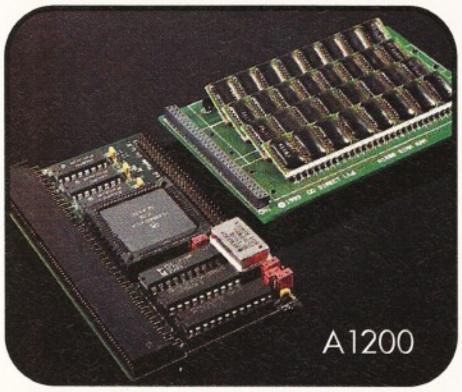
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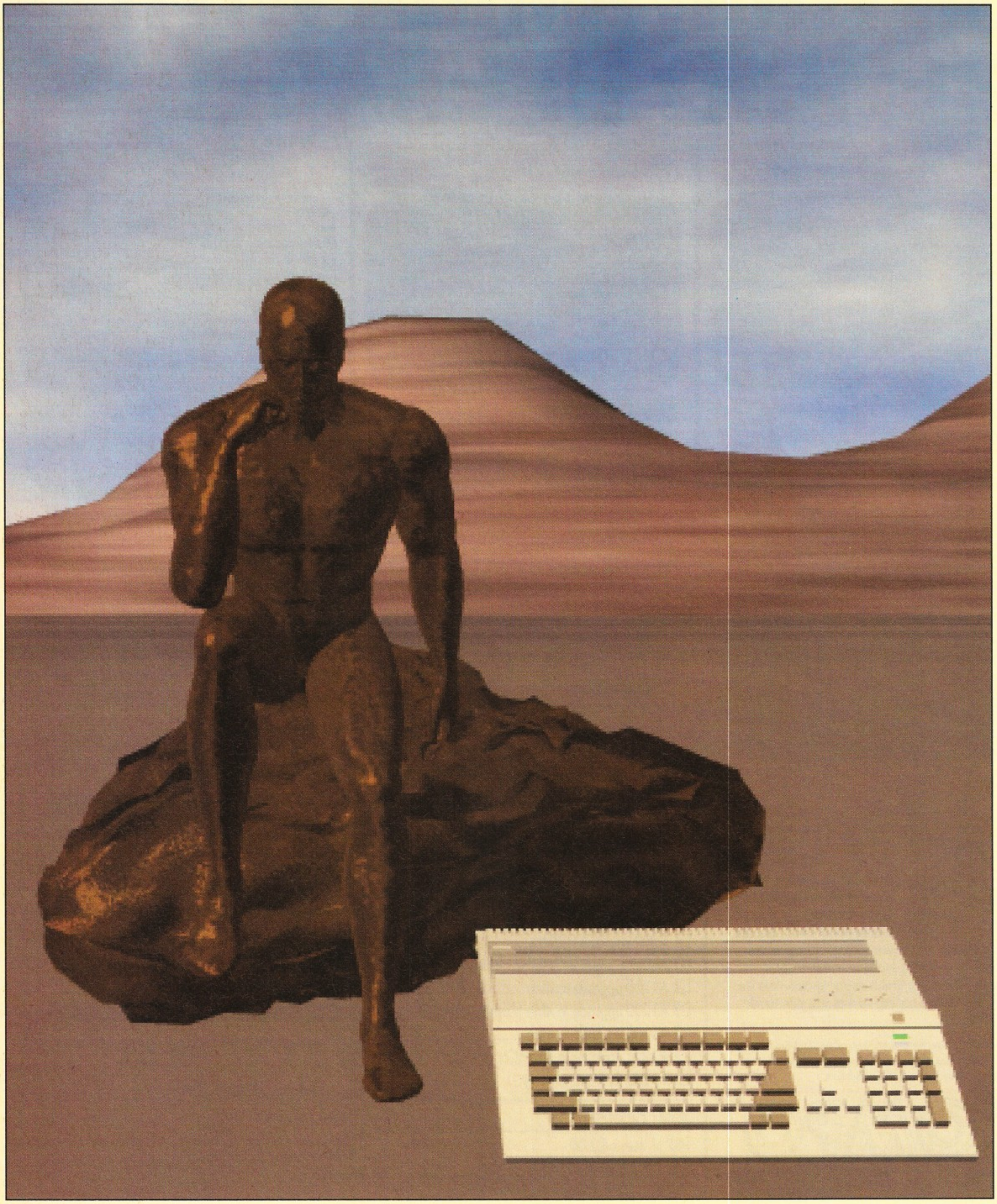
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AMIGA ANSWERS



Hello, and welcome once again, to the area of Amiga Shopper where you can turn to find all the answers to questions concerning your Amiga. It's my privilege, as Amiga Shopper's technical writer, to make sure that not one of your problems is left unsolved. Don't worry, we can help – no matter how simple or complex they may be. At Amiga Shopper we want you to get the very best out of your Amiga. That's why we devote more space than any other magazine to this indispensable service, so please make the most of it and keep your questions coming in. I'll do my very best to find a solution to all your problems.

Answers contents

If you are looking for a solution to a particular problem, why not try using this handy index to the questions in this issue. It's arranged by topic, so if you are being kept awake at night by a noisy hard drive, then be on the look-out for any mention of hard disks.

Don't worry if you come across any unfamiliar terms, just turn to one of our jargon-busting boxes scattered about the nine pages of Amiga Answers for an explanation. The problems are put in a wide context for everybody's benefit. The index on the left is your guide to the topics covered this month.

By now, you are probably familiar with our team of Amiga experts. Mark Smiddy knows all there is to know about AmigaDOS and floppy drives. Jeff Walker is our desktop publishing, fonts and printer correspondent. Gary Whiteley is an expert on video applications and graphics. If you have a query about comms, we'll set our communications guru, Dave Winder, on the case. Toby Simpson is our code clinician. If you've got problems with anything from C to Assembler, try taxing his little grey cells. Finally, we've got a man you can rely on when it comes to operating systems programming – Paul Overaa.

Creating sound modules from MIDI sequences



A: I have always done my music sequencing separate from my computer, which I use mainly for graphics. However, I would like to include music with my slideshow/animations. Is there any way that I can convert the sequences from my Yamaha QY20 into replayable Amiga disk modules?

B: I have seen adverts for parallel port switchers that enable you to plug both a scanner and a printer into the same port. Are they a good idea?

C: I've never seen any mention of the Datel mono and colour scanners (other than in the adverts). Are they any good?

Jon Allen
Herifield, Sussex

A: The normal way of incorporating songs into demos is to create them using a tracker program. OctaMED Pro is one such program, but there are also Public Domain trackers available, including MED (a PD predecessor of OctaMED). The trouble with this approach is that you will not be able to use your existing sequences with any of the trackers that are available and creating existing songs from scratch is likely to be a nightmare you could well do without.

As far as converting existing QY20 sequences go, there is both good and bad news. You can certainly read QY20 songs into any Amiga sequencer program by connecting your QY20 to your Amiga with a MIDI lead, setting the Amiga sequencer so that it uses the external (QY20 generated) clock for its timing, and then playing the QY20 whilst recording the MIDI data with your Amiga.

Once these copies of your sequences have been collected you'll be able to save them to Amiga disks using either a custom sequencer format, or by exporting them as a standard MIDI file. Some sequencers, Bars And Pipes, for example, provide standalone utilities for playing their song files. But, certainly in the case of Bars And Pipes, this would, unless you are already

6

Answers jargon

MIDI – Musical Instrument Digital Interface is a standard devised by electronic instrument manufacturers, allowing a growing number of synthesizers to be controlled by a single keyboard or sequencer. To use MIDI instruments with your Amiga, you'll need an interface.

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using this sequencer, be quite an expensive solution to adopt.

What you really need is a small, cheap (or Public Domain), program that can play songs directly from MIDI files using the Amiga's sound Chips. Unfortunately, there is absolutely nothing like this around and although I have programs that are able to do this, using both normal and encrypted MIDI files, they are primarily for experimental purposes and so are not likely to be distributed as PD utilities in the foreseeable future.

B: A lot of people use these switchers just to make life a little easier. Needless to say, if you can have the two things that you use most regularly connected all the time, you avoid all the hassles of unplugging leads.

C: I'm afraid I don't know enough about them to give you an honest answer! **Paul**

Tascam 488 and Music X

Music

I have an Amiga 500 and use Music X for my sequencing. I also have a Tascam 488 Portastudio mixer/recorder and would like to know if it is possible to control the Tascam's fast-forward/pause/record functions via Music X. If so, will I need any extra hardware or software?

Ian McNeish
Gillingham, Kent

I don't actually have a Tascam 488 around, but, to the best of my knowledge, it can only generate signals for sequencer control. In short – controlling the Tascam 488's transport mechanism via software is a non-starter. I'd imagine that the Cubase/Atari system you saw was being run using another Tascam model (perhaps a 688). **Paul**

More on 3.1

Beginners

In reference to your article on Workbench 3.1, could you please tell me what is involved in the upgrade? Are any of the Chips upgraded? Is the CPU upgraded as well? I have an ECS Chipset; is that upgraded to AGA?

While your article urges us to upgrade, nothing is said about hardware upgrades. Please can we have a bit more information on this to justify the £85 cost. For example, would it be useful to fit a 68020 CPU to my A500+?

G E Bould
Seaford, E Sussex

It is not possible to upgrade ECS Amigas to AGA. It never will be, short of someone designing replacement motherboards, which will almost certainly cost at least as much as an A1200 and probably involve hacking holes in your Amiga casing. It's simply not feasible. If you want AGA you will have to buy an AGA Amiga.

The OS3.1 upgrade comprises a set of new Workbench disks, a new Kickstart Chip (or two Chips for the A3000 and A4000) and three new manuals for Workbench, AmigaDOS and ARexx. Fitting the new Kickstart Chips and installing Workbench 3.1 will provide you with many new and improved features and a much improved GUI than Workbench 2.04/2.05, but you will still be limited to the screen modes and number of colours provided by the ECS Chipset.

You cannot fit any other CPU to your A500+. You can buy an accelerator board and fit that, but you cannot simply swap CPU Chips. If you do buy an accelerator board, keep in mind that it will be a complete waste of money unless you also buy some 32-bit memory for that accelerator board. **Jeff**

Which printer?

Printers

On the front of an Amiga magazine I found a disk called Interword and used it as my word processor to write a book. (I have an A500 and Workbench 1.3.) The book took a year to do and fills two disks.

I now find myself in need of a printer, but am very uncertain as to what printer to use. I sent off for a book on Interword, but my cheque was returned as the company (Kompac UK) were out of stock. I have now lost the address and I'm desperate.

Please can you help me? All I need is the printer, but there are so many and I don't know which one will work. I don't want to spend £200 on something I cannot use.

S J Dean
Wolverhampton

If you buy your printer from a reputable Amiga dealer and ask at the time whether it works with the A500 and Workbench 1.3, you shouldn't have any problems. The dealer may even supply you with a free, or very cheap, Amiga printer driver for the printer. Provided you make it clear when purchasing what computer and operating system the printer is to be used with, if the printer doesn't work on your machine then your statutory rights as a consumer entitle you to a full refund.

If you go for a bog-standard Epson compatible printer, then you should have no problems because the EpsonX, EpsonQ and Nec_Pinwriter printer drivers provided with Workbench 1.3 will certainly work with it.

However, you should be aware that many modern printers are either not supported, or not fully supported, by the standard Amiga printer drivers and preferences programs. I am talking about printers like the colour DeskJets (or compatibles like the Citizen ProJet IIC), the Epson Stylus range, the Canon bubble jets, and even some of the low-cost 9-pin and 24-pin printers made by Star and Citizen, for example.

Answers jargon

Kickstart – The most basic and central part of the Amiga's operating system. These days it is held in ROM, so that it is immediately present when the machine is switched on. A1000s have Kickstart on a floppy disk meaning that on power up this disk must be inserted before the Workbench disk.

To properly drive printers like these, you will need to buy extra third-party software like Studio Professional II (JAM ☎ 01895 274449). But this modern software requires Workbench 2.04 or better, so it won't work on your old Workbench 1.3 A500. **Jeff**

Pablo problems

Hardware

I would be obliged if you could help me with a problem I'm having with my Amiga video set-up.

We use an Amiga 4000/30 with a Picasso II 24-bit display card in our video studio for graphics work and we have recently purchased a Pablo video encoder to enable us to output 24-bit graphics to our editing system.

I already know that I can output the graphics from the Picasso to video tape by hooking the Pablo's video output up to our twin channel GML timebase corrector (and hence through to tape), but what I cannot work out is how to overlay the 24-bit graphics output on to live video using our G2 VC1 genlock.

I understand how to genlock standard Amiga graphics over video from the A4000 with the VC1, but it doesn't seem possible with our Picasso/Pablo arrangement. I faxed VillageTronic in Germany but after two weeks I still had no reply. Can you help?

Peter Ray, Rand Communications,
Newcastle-Upon-Tyne

I spoke to Paul LeSurf at Blittersoft about your problem and the short answer is that the Pablo won't allow you to genlock because it only has composite and Y/C video outputs, not the RGB/sync output required by the G2 genlock.

Additionally, there can also be problems with setting up the screen mode to full overscan, so a full-sized video screen may not be possible, resulting in gaps around the edges of the genlocked image. I'm told that the manual states that genlocking is not possible with the Pablo encoder, though not having seen a manual I can neither confirm nor deny this.

There may be a stop-gap measure which you could take if you have a keying facility in either your TBC or Sony special effects generator, though the results won't be as satisfactory as true genlocking.

If you were to feed to Pablo's video output into a suitable input on either your TBC or SEG (you'll have to work this out for yourself) and then key the graphics output over the video signal, you might be able to achieve the genlock's effect of overlaying graphics on to video. You'll also have to select your colours fairly carefully to avoid some disappearing during the keying process.

If you can use a colour key, then so much the better, but I presume that the best you will be able to manage with your equipment is a luma key.

I know this method will work because I used to use it several years ago with an encoded video output from my Amiga 1000 passed through a CEL timebase corrector into a Panasonic SEG. Whether it provides the results you require, however, only you can decide. **Gary**

Frequently asked questions

FAQ



Gary Whiteley, as we said in the introduction to this month's Amiga Answers, is our expert on video applications and graphics. He regularly produces work for films and TV. Gary also reviews new products for Amiga Shopper – if you turn to page 43 of this very issue, you'll find his opinions on two new CD-ROM collections and Lola Electronic's new genlock.

Good clean output

Q. How do I record my animations to video for a professional-looking result?

A. For the best results, broadcast-quality video (such as Betacam or MII) is the way to go and digital tape would be even better. For the ultimate results, it is still best to render your images in 24-bit IFF and then record them a frame at a time to tape, using a single frame controller and a time-coded video deck capable of receiving instructions through a serial port.

There are two reasonably priced single frame controller systems which can do this – Optonica's Simpatica and Nucleus's Single Frame Controller, both of which are hardware and software solutions. However, buying a top-quality video deck isn't cheap (let's say around £7,000 and upwards), though this method arguably delivers the best quality, so long as you also have a broadcast quality (and also rather expensive) genlock or video encoder to turn your Amiga's RGB output into a component video output.

An alternative method is to record the individual frames to a digital disk system such as DPS's Personal Animation Recorder, Macrosystem's VLab Motion or Applied Magic's Digital Broadcaster 32. At the moment the most cost-effective quality is offered by the PAR, and it's certainly far cheaper than buying a broadcast VCR, encoder and SFC. The one slight drawback is that these systems use compression, but at the highest quality this shouldn't be at all noticeable. Once the animation is recorded on to digital disk it can be played back in real time and output directly to a VCR, meaning that you need only hire a VCR for a very short time.

If neither of these systems is within your budget, another suggestion is to render your frames and store them on as many floptical disks, Syquest cartridge, hard drives, tape streamers, or whatever, and then take either these (after confirming that your planned destination can handle them), or both these and your Amiga to a professional video edit suite with Amiga experience, a single frame controller or a PAR and a high-quality VCR and pay them to do the job for you. In the end it's all down to what you need and what you can afford. **Gary**

Texture confusion

Q. Why won't the many great textures supplied with Imagine work with other 3D programs?

A. Because these textures (and similar ones provided exclusively for LightWave and Real3D) are mathematical equations written specifically to work with Imagine. They are commonly known as "Algorithmic" textures, unlike bitmap textures, which use actual IFF-type images. **Gary**

Grabbing video

Q. How can I capture pictures from my video recorder or camcorder and save them for use with my Amiga?

A. You need a digitiser (also known as a frame grabber) to do this.

There are two main types of digitiser – slow scan and fast scan. Slow scan digitisers require that the incoming image is absolutely still, either from a video recorder (VCR) with a perfect freeze-frame facility, or from an image which is static in front of a camera, because a slow scan digitiser takes longer to capture an image than the 1/25th of a second it would normally be displayed for if the tape was rolling, or the camera image was moving.

Fast scan digitisers capture a single frame of video in 'real-time' by using memory buffers which sample and hold every frame as it passes through the digitiser. Note that fast scan digitisers can't grab entire sequences of video in real-time because of the sheer amount of data involved, though there are now systems (albeit quite expensive) which can.

Some Amiga digitisers, such as the VLab range, are internal and require an Amiga which has a free Zorro slot. Others are external and will work with any Amiga by connection to its parallel port. Both composite and S-Video digitisers are available and the best quality is obtained with S-Video. Rombo have always produced good-value-for-money digitisers and their Vidi-Amiga 12RT and 24RT models are no exception. Harwood's ProGrab 24 is also highly regarded.

You should also realise that grabbed images can require a lot of storage space and a hard drive and 2–4Mb of RAM are recommended if you want to grab top-quality images at high resolutions. **Gary**

Flying logo mania

Q. I need to animate a company's logo with LightWave 3D, but I'm not sure how to go about it. What are the best ways of doing this?

A. The first thing to do is to produce a copy of the logo in a 2D form within your Amiga. The simplest way to do this is to scan the logo as large as possible with either a flat-bed or hand scanner and save it as an IFF bitmap image in as few colours as possible. If you don't have a scanner, you could try one of your local print bureaus and get them to save the scan on to a low density PC disk (if you haven't got a HD drive) in GIF, or (preferably) IFF format. Then use CrossDOS, MultiDOS or an equivalent to read the disk with your Amiga.

Alternatively, you can digitise the logo in front of a video camera (again as large as possible). If neither of these options is available to you, then you'll have to draw the logo by hand in a paint program – preferably in hi-res interlace, white on black.

The simplest way to convert the 2D logo into a 3D object is to use Axiom Software's Pixel 3D Pro software, which can turn bitmapped graphics into 3D extruded objects, but if you don't have this, you could load the image into LightWave's Modeler as a background and then carefully build a 2D object point-by-point and polygon-by-polygon, and then extrude it into 3D.

On the other hand, if the logo is simply a name made from letters, it might be possible to find a Postscript font which is identical (or very similar) and then construct the logo directly in LightWave as text. **Gary**

Rendering for print

Q. I've been asked to do some 3D rendering for the cover of a CD – what resolution should I use? What format should I save my work in for the layout house?

A. Most people seem to recommend that you render your images at at least 100 pixels to the centimetre for this kind of print work, which means that if your image is to cover the entire front of the CD sleeve (about 12cm square), you'll need to render the image at 1200 x 1200 pixels in full 24-bit. JPEG compression isn't favoured, but, if you have to do this to fit the image on a disk, use the lowest compression possible.

Since it's likely that the layout will be done on a Mac (or possibly a PC), you'll need to supply the image either on an MS-DOS disk (HD if possible)

Gary Whiteley

or, if it is too large to fit on a disk, on a Syquest cartridge or other storage medium as recommended by the layout bureau. This can be a complex problem, especially since many Mac-users don't really understand much about their computers and it may take you some time to convince them that it really is possible to transfer Amiga images to Photoshop. The best thing to do is to ask the bureau what they need and try to keep everything as simple as possible for them. **Gary**

Converting the unconverted

Q. I have some old Sculpt3D objects which I want to resurrect and re-animate. I also have some .DXF format files which I use with 3D Studio on my PC at work. How do I convert these objects for use with Imagine and LightWave?

A. There are several choices here. The simplest is that Lightwave can load Sculpt and .DXF files directly, so all you need to do is feed them to your Amiga in an appropriate manner (PC disk, comms connection, etc).

On the other hand, whilst Imagine 3 can load .DXF files it really isn't very good at it (unless you have version 3.1 or later) and it can't load Sculpt files at all. There's no point in saving your converted objects from LightWave, as Imagine doesn't understand this format either. What you need is a conversion program, and the best of these is Syndesis Corporation's Interchange Plus v3 (Syndesis also wrote the TIO converters for LightWave). An alternative is Pixel 3D Pro, which has the added attraction that it can also turn bitmaps into 3D objects, though personally I think Interchange does a better conversion job. **Gary**

Pause for reflection

Q. Why can't I ever seem to make a good, chrome-surfaced object? It never looks right and has black patches where the reflections should be.

A. You probably don't have an image loaded for the object to reflect. In Imagine you need to load a Global Brush Image (use the Action Editor), in other programs it is called a reflection map. Just make sure that your reflective object has something to reflect and that should help solve your problem.

RGB or video monitors – what's best?

Q. I have my Amiga connected to my TV from a modulated video output, but my friend has his connected to a proper RGB monitor. His display looks much better than mine. Why?

A. Your friend's monitor looks better because it is translating the Amiga's video output into a picture in the most direct way – straight from the RGB (Red, Green and Blue) port to the monitor's own RGB display circuits, with the minimum of electronic circuitry in-between.

In the case of your TV the Amiga's internal RGB video signals have first to be converted to a modulated RF signal, meaning that the RGB components have to be combined together and then modulated into a signal suitable for transmission to your TV. Once inside the TV, they must be de-modulated and converted back to RGB so that the monitor can display them and, as a result of this modulation and demodulation, the original Amiga RGB signal will inevitably become somewhat degraded. Obviously the best solution, if you can afford it, is to buy an RGB monitor. **Gary**

Video output

Q. How do I record my Amiga graphics to video?

A. Unless you've got an Amiga 1200 or 600 (with their own video outputs), then you'll need some extra equipment, specifically a modulator, genlock or encoder, depending on what kind of recording you want to do. You may also need a genlock (even if you have an A600 or A1200) because of the extra functions, such as graphics overlay and simple fading, that they make available.

If your Amiga has an RF (modulated) output, then this can be used for connection to either a TV or a video recorder (VCR) via their respective aerial input sockets. An RF video signal won't be as good as a direct video signal, because it's been processed somewhat and so has had its quality compromised, One advantage is that an RF video signal can also carry sound, resulting in a simple one-wire connection. If your Amiga doesn't already have an RF output you'll need to buy a video modulator to fit on to your machines RGB port. Several different modulators are still available, including Lola's L520, with prices starting from around £30.

Modulators may also output composite video, which provides better signal quality than RF, but without the audio. Most VCRs can accept composite video either via separate external inputs or through a SCART (21-pin Euroconnector) connection. The Amiga 1200 also has a composite video output and you should use this in preference to the RF output if you want better video quality.

If you want to overlay graphics and titles over a video image then you'll need a genlock. This connects to your Amiga's RGB port and to the video output (not RF) from a VCR or camera. There are a number of different Amiga genlocks, ranging from less than £50, to well over £1,000, depending on features and output quality. Some genlocks accept composite video input only, others are S-VHS (also known as S-Video or Y/C). S-Video genlocks provide better quality than composite ones but only if they have an S-Video feed.

You'll also need a second VCR to record the results of the genlocking and at least two TVs or monitors, so you can see what's going in and out. Some genlocks are simple, allowing Amiga, mixed Amiga and video, or video output only, whilst others have faders for mixing between the Amiga and video inputs, determining the level at which the graphics are superimposed over the video images. More sophisticated, and better quality, genlocks generally cost more, though in my opinion some are very overpriced. One medium-quality genlock I recommend would be Lola's new L1500 composite genlock (see the review on page 43), as it provides good quality for a very reasonable price. **Gary**

3D Rookie

Buying

I am an A1200 owner and I have a few questions about 3D graphics. My Amiga is standard issue, apart from the addition of a 420Mb hard drive. Since seeing all the articles in Amiga Shopper about 3D graphics I want to get in on the game, but as I don't have any experience in this area, I thought it might be best to ask someone who does....

I've heard a lot about the famous Imagine. Is this the best choice or are there other, better options which I should be looking at? Can you tell me where to get Imagine from, as I've not seen it advertised much, and would you say that it is easy to learn?

What kind of Amiga set-up would I require to make the best use of a 3D package? I'm saving for a GVP A1230-II 40MHz, 4Mb accelerator – is this a good choice for running Imagine efficiently? I expect that you'll probably tell me that the more memory, the better, but I would like to know what I should add to my A1200 to make it cope adequately. I am willing to spend a lot to get good results.

Is Imagine able to make animations with the rendered images? If not, what else would I need to be able to accomplish this?

Colin Gray
Prestwick, Scotland

Let's start with the software choices. At the moment there are three main routes into serious Amiga 3D in the UK – Imagine, LightWave and Real3D v2, of which the latter two cost serious money. In terms of learning from scratch I'd have to say that LightWave is probably the easiest, with Imagine next and Real3D the hardest to learn, at least if you want to make best use of all the many wild and wonderful features that each program contains.

Comparing the three programs isn't easily done here because each offers unique features, as well as different ways of achieving similar end results. Personally, I still use Imagine as well as LightWave, but there are quite a few Amiga 3D pros (and amateurs too) who swear by LightWave or Real3D alone. As you can tell, the choice is ultimately a personal one, based on cost, need and what you're used to. In your case, you're not used to anything, so I'd say – find out everything you can about each program before you make the plunge, though, on a pure cost-basis, Imagine 3 is likely to be your first choice.

Yes, Imagine can make animations, but only in its own format. What you'll need is another program, such as MainActor, DeluxePaint, or even Art Department Professional – or ImageFX if you're feeling flush – which can build animations out of a set of rendered images. This way you can produce true IFF anims which can be played back with a variety of viewers and DTV programs directly from hard drive with no particular problems, except speed.

What you must remember is that the Amiga just cannot shift data fast enough (unless you're working in small screen sizes or low resolutions with limited colours) to make long animations replay successfully at full frame rates (that's 25 frames per second in PAL). On the other hand, if playback speed isn't such a big deal and you can



Frequently asked questions

Toby Simpson 

FAQ



Toby Simpson is our expert code clinician. He writes our on-going C programming tutorial to create a file-finding program, which is on page 86 of this issue. On ShopperChoice (Coverdisk 2) you will find the full listings for his C tutorial, along with the text. Toby has also tested out our DICE Coverdisk program and has written the instructions for it starting on page 6.

Memory management

What is an MMU and is it of any use to me?

MMU stands for Memory Management Unit. It is a clever piece of hardware designed for controlling and managing the memory you have inside your computer. Most Amigas do not come with an MMU as standard, only the A3000 and A4000/040 do.

It is possible to add an MMU to your machine when you upgrade with an accelerator. The MMU sits on the same Chip as the microprocessor, it is actually built in. The full 68030 also comes with an MMU built in, but, be warned, the lower cost 68EC030 – the one shipped inside all A4000/030s – does not.

On Amigas having an MMU it is useful for two main purposes. The first is for development. Having an MMU allows such development tools as Enforcer, which trap any illegal memory accesses your program may make. The second is for Virtual Memory. This allows part of your hard disk to pretend to be real memory. It is very slow in comparison to real RAM, but can mean you can use some memory intensive programs you may not otherwise be able to, such as rendering programs, and art packages. **Toby**

Faster, faster...

What is an FPU and is it of any use to me?

The acronym FPU stands for Floating Point Unit. It is a special bit of hardware which allows your computer to perform floating point number operations much faster.

FPUs make jobs like DTP and rendering considerably faster. The 68040 Chip comes with an FPU built in, and users of other 68000 series chips can add an FPU using a 68881 (now outdated) or 68882 Chip. A lot of accelerator boards either come with the 68882, or provide a socket, so that you can add it at a later date. **Toby**

Which language?

I am thinking of learning a programming language and I can't make up my mind whether to learn Assembly language or C. What would you recommend and why? Are there any other languages that may be of interest to me?

Every programmer you ask will probably have a different answer to this one. Mine is that I'd learn C if I were you. C is easier to learn, easier to understand and easier to fix when things go wrong. It is also easier to write Amiga-specific applications using windows, gadgets and the like.

Assembly language is a low-level language (see the box in the Coverdisk tutorial on page 6 for a more detailed discussion on high- and low-level languages). This means that you are working much closer with the microprocessor, controlling its every operation.

Programs written in Assembly language take longer to write, and are less easy to maintain than their C counterparts. Another thing to bear in mind is that the Amiga's operating system was written in C and has been designed to be used by C. It is a lot harder to interact with the Amiga's operating system in other languages.

As for other languages, the list is endless. There is an advantage to learning a nice, standard language, such as C, in that you can use that knowledge on other computer systems also, such as the Macintosh and PC.

The same also applies to languages like BASIC and PASCAL, although dialects of both of these vary a lot from machine to machine. If you're just interested in playing about a bit with programming, try ARexx. If you have Kickstart 2 then you have it, and it can be very useful in the future for advanced usage and control of applications such as DTP and art processing tools.

"ARexx: Your Amiga's built-in Turbocharger", £17.95, ISBN 1-898275-09-2, published by Future Publishing (call ☎ 01225 822 511 for a copy) teaches ARexx from scratch.

Other languages worth looking at, if you're just interested in playing about and making whizzy things happen on the screen and through the speakers, are such languages as AMOS and Blitz-BASIC. Both of these are Amiga-specific, but can be great introductions to programming as you can see pretty visual results quickly. **Toby**

Include magic

What are the Include files, and why do I need them to start programming C or Assembler?

The magical Include files are necessary to program the Amiga seriously. They contain all the definitions which your compiler, or Assembler, needs to access the Amiga's operating system. It is feasible to get by without, but you'll be severely limited in what you can do, especially in C.

Commercial compilers and Assemblers, such as SAS C, or DICE C 3.0 and DevPac, come with the Include files relevant to that product. This month's Coverdisk comes with the C Include files. Shareware and PD compilers and Assemblers will not come with Include files as they have to be licensed from Commodore.

To obtain the latest Include files (currently 3.1), and a lot of documentation and example code, send a cheque for £23 made payable to "Commodore Business Machines (UK) Ltd." to:

Sharon McGuffie,
Commodore Business Machines (UK) Ltd.,
The Switchback, Commodore House,
Gardner Road, Maidenhead, Berks. SL6 7XA.

Include a covering letter explaining that the cheque is for the "3.1 Amiga Developers' Upgrade". If you're serious about Amiga development, you might also like to enquire about becoming a registered developer at the same time. **Toby**

Answers jargon

Interpreter – Another means of translating a program for the computer's convenience. An interpreter translates a program line by line as it is running and therefore tends to be slow.

Compiler – A means of translating a program to render it understandable to the computer. A compiler translates the whole thing into machine code before it is run. The compiled program is generally much faster than its interpreted counterpart.

Basic – Beginners' All-purpose Symbolic Instruction Code is a high-level programming language. It combines a fair amount of power with ease-of-use.

71 *put up with 8–12 f.p.s, then no problem. Otherwise you'll need some way of compiling your rendered images to either videotape (by using an expensive video deck and a single frame controller) or by rendering the animation to a digital disk recorder such as the Personal Animation Recorder (PAR).*

With regard to hardware requirements, processor speed and memory will be the main concerns you'll have to deal with, since you've already got a good-sized hard drive. At the moment you'll be able to scrape along with what you've got if you're using Imagine (but only just). LightWave requires at least 8Mb of memory and I'd recommend the same for the other two programs.

You were right in assuming that I'd tell you the more memory the better, so here goes; the more memory you have the better. Why? Because complex 3D models take up memory, as do any bitmap images which you may want to use as texture, bump, reflection, displacement or other types of surface maps. Once you get a complex scene together with lights, textures and so on then you'll find that memory disappears quickly. Even the 12Mb that's fitted to my Amiga isn't enough sometimes, and Imagine and LightWave have refused to do their worst until I've tweaked a scene, closed down some other software which was running in the background or otherwise reduced the memory overhead on the system. As far as processing speed is concerned, most 3D applications run much quicker if a maths co-processor (FPU = Floating Point Unit) is available in addition to a faster CPU, so think about adding a 68882 FPU to your A1230 when you get it.

For your information, Imagine 3.0 is available from Emerald Creative Technology, Rapid House, 54 Wandle Bank, London SW19 1DW, ☎ 0181 715 8866, for £103.45 inc p&p. LightWave is available for around £449 and Real3D v2 from £339 from various UK distributors, including White Knight Technology. **Gary**

Sample Playing

Music

I'm using StereoMaster to store sound samples on to hard disk for use as sound effects in a video I am making. Do you know of a PD program which has a menu like Digital Sound Studio which allows samples to be recalled and played. StereoMaster has this facility, but is restricted to 18 stored samples played from the numeric keypad.

Colin Ford
Kelso, Roxburghshire

To be honest, I can't remember what the Digital Sound Studio's menu arrangements look like, but there are plenty of PD sample playing utilities around. I would assume that there are also some PD equivalents of programs like Directory Opus that could also be used to set up screens containing sample playing buttons. I'm afraid, however, that I just don't have the time to keep up to date with all the PD software that is available and would suggest that the best people to talk to is Seasoft (☎ 0903 850378) – they have a lot of PD music software in their library.

I think, however, that you'll find that most of the PD utilities (e.g. SuperSound) tend to be single sample play programs and, to be honest, this is really all you need when reading samples from a hard disk. The idea is to place the sound playing program in your c: directory and then make that sound playing program the default tool for all of your sound sample icons.

To do this, just select each icon, pick Information from the Workbench's Icons menu, and then type the player program name into the requester that appears and save the changes. If you do that for all your sound samples, then you'll be able to open your samples window and play any of them just by double-clicking on their respective icons.

You'll probably find this more convenient, and more flexible, than loading samples into a menu based program anyway, because then the only limit to the number of samples that you'll be able to access in this way will be the capacity of your hard drive! **Paul**

Virtual Memory

Hardware

I want to use Imagine 2 for animation and am going to buy a hard disk and an accelerator for my 2Mb WB3/A1200. Not having the cash for extra RAM, I want to use the VMM virtual memory program (reviewed in Amiga Format 65).

Is the Viper the cheapest 030 available with an MMU or is there an alternative?

Also, what are the disadvantages to using virtual memory?

Simon Brown
Leicester

The Viper 68030 series boards are quite competitively priced and this range of accelerators are very popular. With Amiga retailers clamouring for business at the moment, you should however take quoted prices with a pinch of salt (i.e. phone around and do some serious haggling to get the best deal possible).

Virtual memory is a nice idea in principle and the only normal disadvantage is the speed penalty as sections of programs are swapped in and out of memory. With an Amiga being used for graphics work, however, you'll need as much Chip memory as possible and this means that, for the best results, memory paging needs to be kept out of Chip memory. Your machine has just 2Mb of Chip RAM and so, whether you are using VMM or not, program code is going to eat into that Chip memory to some extent.

I've not used VMM and I don't know how configurable it is but presumably it should where possible attempt to use Fast RAM paging to keep program code out of Chip memory. The bottom line, as far as your intended use is concerned, is that what you really need, whether you opt to use VMM or not, is some extra (Fast) RAM before anything else!

If however you do decide to follow your own path and not get extra RAM then I'd suggest you find a supplier willing to let you see Imagine running under VMM (on a 2Mb machine) before buying any hardware at all. **Paul**

Answers jargon

Accelerator board – A device which either includes a central processor like the Amiga's, or a more advanced one in the same range, but operating at a higher speed. An accelerator is useful for calculation-intensive applications, such as 3D rendering, as it greatly speeds up the process.

Upgraded Amiga

Buying

I wish to upgrade to a faster, more expandable, Amiga since I would like a PC Bridgeboard in the future. With about £1,000 to spend the problem is that this will only get me an A4000-030 which is slower than a Viper accelerated A1200. If I picked up an old A1500 and fitted a 24-bit card and a 030 Warp Engine would this be a 100 per cent fully compatible AGA machine? I can, incidentally, only raise cash by selling my existing machine.

Jeff Simpson
Edinburgh

No, and I wouldn't recommend you following the A1500 upgrade route anyway. Normally, I'd advise you to get on to the A4000 platform via an 030 processor and upgrade that to an 040 as and when you can. Unfortunately, at the moment, it is a bad time to swap machines and in particular a very bad time to try and sell your existing set-up. My advice is to stay with the system you've got until there are clear indications that Commodore liquidation fiasco is finally settled and the Amiga's future is visibly safe. At that time the A4000 path is the one that I would choose! **Paul**

Physical handicap

Buying

I am a physics undergraduate. For presenting reports on experiments I use the PCs on campus running Lotus 123, for producing graphs, and Word for Windows, which has a built-in equation editor.

The problem is, I have just bought an A1200 (with hard disk, multiscan monitor and so on) and I'd much rather use this in the comfort of my own home instead of fighting five thousand other students for the use of a handful of machines.

I plan to buy Final Writer for my textual needs and DeluxePaint for diagrams, but I would require other programs for equations (lots of nasty Greek symbols required) and graph plotting. Are there any such programs available for the A1200? If so, where do I get them and how much do they cost?

C M Wilson
Essex University

Sadly there is no Amiga equivalent (yet) of the extremely useful equation editor in Word for Windows. To do the same in Final Writer, you would need to buy a suitable Greek symbols font – that is, if the Symbols font supplied with Final Writer does not contain all the symbols you ▶ 75

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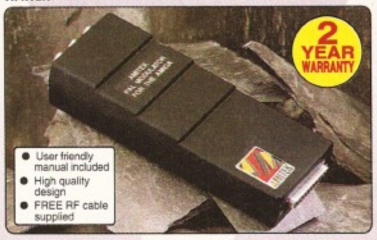
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Frequently asked questions

Paul Overaa



FAQ



Paul Overaa is our operating systems programming expert and a regular contributor to Amiga Answers. Paul has had several books published, including Mastering Amiga Assembler, Mastering Amiga ARexx and Mastering Amiga C. His main interest is in program design and he is heavily into the music side of the Amiga. Paul lists his other interests as red wine, mathematics and wind surfing!

Beginner language

Q: What language is best for beginners wanting to learn how to program the Amiga?

A: Almost everyone starts by using some form of BASIC as their first language. As far as facilities go AMOS is undoubtedly good, but in the early days there is a lot to be said for sticking to a 'Microsoft flavoured' version such as HiSoft BASIC. Why? Microsoft have set an established standard in the computer world and most of what you learn about a Microsoft-style BASIC will stand you in good stead, not just with BASIC on the Amiga, but with BASIC on other computers. **Paul**

The meaning of Guru

Q: Guru Numbers – what are they?

A: Guru Meditation Numbers are codes usually displayed (using an Alert requester) just before the machine is about to crash. The codes are divided into several parts with the bit to the right of the decimal point representing the memory location of the task running when the error appeared. The left hand portion is an encoded error number in which the first two digits identify the operating system module that reported the error. The next two digits indicate a general error class (used to identify such things as out-of-memory conditions) and the last four digits give additional error-class specific information.

Gurus can also be caused by problems detected by the 680x0 processor itself. These are called processor exceptions and if this occurs, the Guru subsystem and general error codes will be zero. The exception Guru which starts with 00000003 represents a specific error code of 03, and this is probably the most familiar to most Amiga users. It is caused by a 680x0 program instruction trying to access an odd numbered memory address when it shouldn't (this produces so-called addressing errors). **Paul**

C listings

Q: What is needed to turn C program listings into runable programs?

A: The C programs found in magazines represent listings printed from ordinary text files which have been created using programs like ED, MEMACS or some other text editor. These program files are called 'source code files' and are created and saved in the same way as any other type of text file. To start with, then, it is necessary to type in the listing to create a C source file.

Unfortunately, several additional steps are needed to convert source files into runable form: a piece of software called a compiler needs to be used to translate the program lines into code that the Amiga's processor can understand. Next, this 'object code' form has to undergo yet another process called 'linking' to produce a final, runable program. There's a lot more to the story, but most C programming books will outline the steps and their purposes in some detail. **Paul**

Frequent crashes

Q: Having decided to learn C, I've obtained a number of Public Domain C compilers. Even though programs compile without any errors, they still frequently crash the machine. Why?

A: All it really means when a compiler compiles code without producing error messages is that the code appears to be syntactically correct to the compiler. Doing such things as making library calls without opening the appropriate library, or trying to return memory that hadn't been acquired in the first place, can all cause the famous Guru to appear and the solution is to look far more carefully at the code that has been written. **Paul**

Sound sampling

Q: 16-bit sampling is getting very popular on machines like the PC. Will 16-bit sound sampling packages, such as Clarity 16, mean the death of 8-bit Amiga sound sampling?

A: The reason 16-bit sampling is taking off on the PC is that offerings like Creative Labs 16-bit Soundblaster multimedia packages, despite the fact that they are very good, are incredibly cheap. The 16-bit revolution will only happen on the Amiga when the price of good 16-bit Amiga sampling hardware, and decent editing software, starts becoming available at prices that are affordable by the average user.

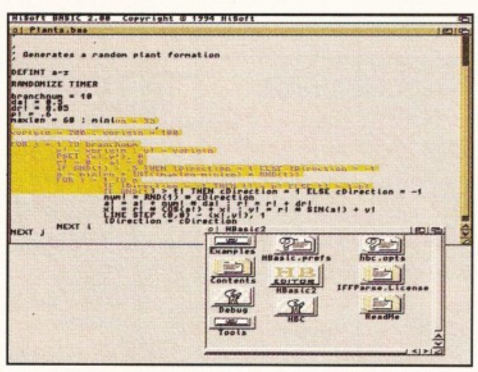
Clarity 16 has not found favour with Amiga users in general and other 16-bit Amiga systems are far too expensive. An affordable Sunrize 16-bit card could do for the Amiga just what Creative Labs 16-bit Soundblaster cards have done on the PC but until something like this happens, or we get enhanced sound facilities provided by Commodore, 8-bit samples will continue to be used extensively on the Amiga. **Paul**

Getting into MIDI

Q: I want to get into MIDI and have been looking for packages that are as good as some of the Atari ST offerings. I've narrowed it down to two: Blue Ribbon Soundwork's Bars And Pipes Professional and Dr T's KCS. Which is the best and how does it really compare to Atari offerings such as Cubase and Creator/Notator?

A: For years Amiga Midi software has been getting better, but Atari ST software, of course, has improved too and, at the moment, the differential between the ST and Amiga music packages is almost as wide as ever. So the bad news is that if you didn't already have an Amiga, but were after Cubase and Creator/Notator quality software, then I'd have said that at the moment your best bet would be to get an Atari ST or Falcon!

However, the two Amiga sequencers you mention are impressive: I've used Dr T's KCS and found it versatile, well supported, and very reliable – I even use it on live gigs! I also use Bars And Pipes regularly, but despite the fact that it is innovative and more powerful that KCS in many respects, I tend to regard KCS as a better 'workhorse' sequencer. Be warned – an awful lot of Amiga musicians take the opposite view. **Paul**



The core of statements of HiSoft's BASIC 2 can stand you in good stead for working with BASIC on other computers.

require, which it probably won't – and fudge the equations by using text boxes and drawing lines. Before you ask, it would be a similar story with Wordworth or any other Amiga word processor. So, you will be able to do what you want to do, but it will much harder work than it is with the Word for Windows equation editor.

You may find that the drawing tools in Final Writer are good enough for creating many types of diagrams – you can very easily draw lines and boxes and shapes and ellipses, and so on. However, if you are bent on buying a painting program, do consider Personal Paint and Brilliance before you rush out and grab DeluxePaint. Many people consider DeluxePaint to be a poor third to these two more modern Amiga programs which are still being enthusiastically developed.

If your diagrams need to be printed at high quality (without jagged curves and diagonals, that is), then you should consider a structured drawing package like ProVector. (The other two Amiga-structured drawing programs – Art Expression and ProDraw – may still be available, but have ceased development.)

For graph-plotting you should consider the TurboCalc Professional 2 spreadsheet, or wait a little while until Softwood (the makers of Final Writer) release FinalCalc. Alternatively there are dozens of PD and shareware programs for plotting graphs from equations. If you have access to the Internet, check out the files in pub/aminet/misc/math, or contact a PD library that stocks either the Fred Fish collection, or the Aminet CD-ROMs. **Jeff**

Answers jargon

PAL – One of the main TV colour coding systems which is in use around the world and was developed in Britain. PAL refers to Phase Alteration Line. In fact, there are several hybrid PAL systems in use, all of which are slightly different.

NTSC – National Television Standards Committee. This is the name for the TV colour coding system used in the USA and other countries.

Standard conversions



I have a Panasonic video recorder with NTSC playback only. Is it possible to use my Amiga 1200 to convert UK PAL format video tapes to USA NTSC format?

What hardware/software would I need and is it OK to use PAL video tape, or do I have to use NTSC tapes? I understand that the PAL video signal needs to be converted to NTSC. Is this correct?

Stephen Cooke
Winstanley, Wigan

I'd guess that what you're trying to do is save money by converting PAL tapes to a format you can play on your video deck? The trouble is, you don't seem to have thought this through very well, or you'd have realised that to be able to convert PAL tapes to NTSC you actually need access to a PAL video deck in order to play the original tapes back so that they can be converted to NTSC! You'll also require a TV or video monitor which is capable of showing NTSC video, since the NTSC format doesn't replay successfully on standard PAL monitors or TVs. So why not just cut out all the extra problems and just buy (or rent) a PAL video recorder?

To answer your question – no, you can't use your Amiga 1200 for standards conversion. What you require is a video standards converter (a good one could cost from around £1,000 upwards) in order to convert the PAL video signal into NTSC.

You'd be better off using NTSC tapes if the programme is quite long because more tape is required to record an NTSC programme than a PAL one since PAL runs at 25 frames per second and NTSC at 30 frames per second, hence you'll need around 20 per cent more tape to record an NTSC program than you would to record a PAL one.

In the long run you'd be better off shelving the NTSC machine, unless you have particular reason not to, and getting a proper PAL one. If you really must get your tapes converted look in your local papers or check the Yellow Pages for video companies which offer standards conversion – there must be a few around the Manchester/Liverpool area. It will cost you, but nowhere near as much as buying your own standards converter! **Gary** ■

Fill in and get answers to your questions — AS**47**

If you send in a question for the Amiga Answers experts, please fill in and include the form below (or a photocopy if you don't want to cut up your magazine). If you have several questions in different fields that should be addressed to more than one of our experts, please send in your queries on separate forms.

Send your form and question to: Amiga Answers, Amiga Shopper, 30 Monmouth Street, Bath, Avon BA1 2BW.

Name: ______________________

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____

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Your machine:

☐ **A500** ☐ **A500 Plus** ☐ **A600** ☐ **A1000**
☐ **A1200** ☐ **A1500** ☐ **A2000** ☐ **A3000**
☐ **A4000**

Approximate age of machine: ______________________

Kickstart version (displayed at the "insert Workbench" prompt)

☐ **1.2** ☐ **1.3** ☐ **2.x** ☐ **3.x**

Workbench revision (written on the Workbench disk)

☐ **1.2** ☐ **1.3** ☐ **1.3.2** ☐ **2.04/2.05**
☐ **2.1** ☐ **3.0**

PCB revision (if known). Do not take your machine apart just to look for this!

Total memory fitted (see AVAIL in Shell for Workbench 1.3) __________

Chip memory available (see AVAIL in Shell) __________

Agnus chip (if known) ______________________

Extra drive #1 (3.5in/5.25in) as DF : Manufacturer __________

Extra drive #2 (3.5in/5.25in) as DF : Manufacturer __________

Hard disk: __________**Mb as DH** ________**: Manufacturer**

____

Extra RAM fitted – type, size in Mb and manufacturer __________

Please indicate details of any other hardware which could help us to answer your question:

____

Now, use this space to describe your problem, including as much relevant information as possible. Please continue on a separate sheet if necessary.

____

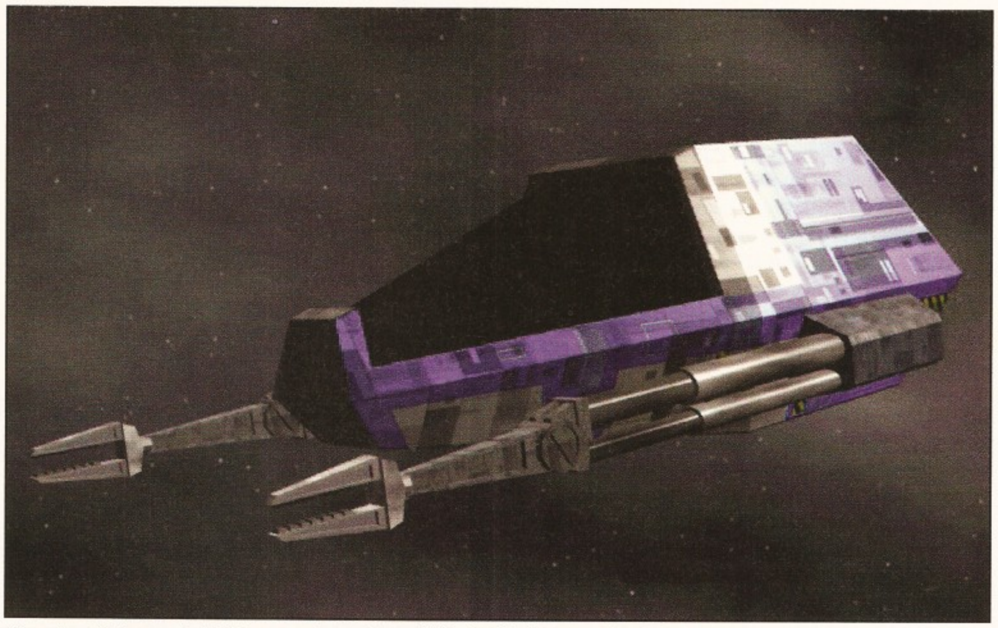
Dynamics

The three Ds Of 3D – Part 3

Mojo, *the very talented animator working with Ron Thornton on TV series such as Babylon 5, is back to give you some advice on how to achieve those finishing touches to create a truly stunning-looking spaceship.*

When I was young, I liked to build Star Trek models. I spent all my time building and painting them and adding little lights, trying to make them look just like the ones on TV. Of course, the best part was finishing, so I could pick it up and fly it around the room, mouthing sound effects and engaging in make-believe space battles. There's no doubt that the entire point of building them was to make them do things – not to sit on a desk and look pretty.

Over the last two months, I've taken up a lot of valuable magazine space to teach you how to build a spaceship, how to paint it, add little details and make it just like the ones on TV. Those of you who are still following all this have hopefully built the cool-looking space Pod from Babylon 5. However, I'm sure you're quickly becoming fed up with all this tedious technical mumbo-jumbo. Well, I don't blame you. You want to pick it up and have some fun with it, for pete's sake! Your dedication is now about to pay off, as this month we get into all the fun bits: Lights, Camera and Action!



If you've followed all this, you have hopefully built the cool-looking space pod from Babylon 5.

Ready for your close-up

Many people like building things. They enjoy model making and spend all their time in Modeler. Personally, I'd much rather take a model and stick it in front of the camera. To me, that's the fun part – making movies. The Layout section of LightWave is where all this happens. It's a sort of virtual sound stage, where you have total control over what winds up on the 'film'. The two most critical areas of this stage are lighting and movement, and it usually works out best to start with motion.

Load up a starfield object and your Workpod into LightWave. We're going to create a very simple animation of the Pod passing in front of the camera. That is, it's going to look simple. In actuality, there are quite a few details that need attending to in order to make this happen. Enough, in fact, to fill the next few pages! (This tutorial assumes you have the most rudimentary understanding of how to use your 3D software. I am not going to explain things that your manual covers.)

Set your scene for 60 frames. We want to make the Pod fly in from the distance, towards the camera and off the screen. Fortunately, 3D programs do most of the actual animation for us, using a system called key frames. All you need to do is assign a starting and ending point for your object (or light or camera) and the computer does the rest! It figures out all the motion in between these points and animates the object on its own. Sometimes, for a complicated motion, you may need to set more keyframes to give the computer a better idea of the path you want your object to follow. However, in this case, two keyframes are all that's needed to make the Pod fly in more or less a straight line.

Move it

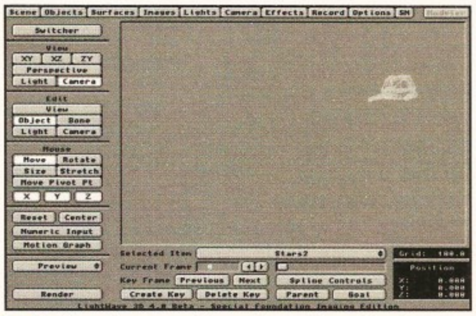
While looking through the camera, use the mouse to move the Pod off into the distance (see figure 1 on page 77 to follow like a helpless automation). As in Modeling, all objects move according to the X (left and right), Y (up and down) and Z (in and out) axis. The view through the camera always shows true perspective, while top, side and front views (as in Modeler) are also available for more precise placement (see figure 2). Create a keyframe for the Pod in this position at frame 0 (or frame 1 if you like – 0 is simply easier since you start off already there). In LightWave, a shortcut for keyframe creation is to hit the RETURN button twice (hit the HELP key for a list of keyboard shortcuts – most other programs should have them as well).

Now move the Pod towards the camera and to the left until it goes off the screen and behind the camera (figures 3 and 4). Create a keyframe for this position at frame 60. That's it! Dragging the frame slider at the bottom of the screen will give you a rough idea of what the motion is like.

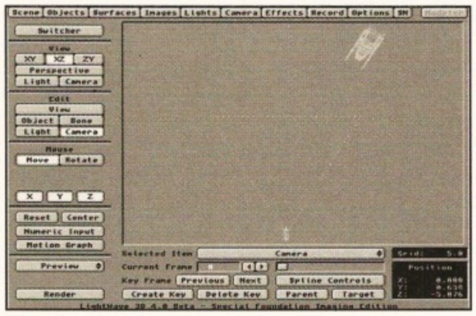
If you think it's close to what you want, create a wireframe preview of your scene. This will show you exactly what your shot will look ▶ 78

How to achieve perfection... the finishing touches

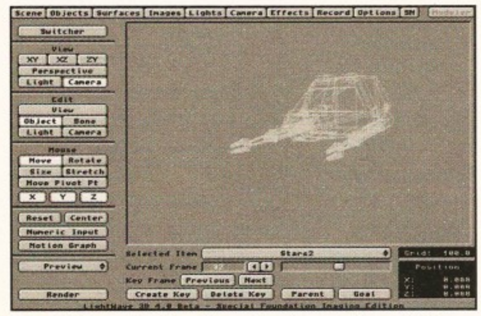
This is your step-by-step guide to how to create those finishing touches that will turn your spaceship into a real corker.



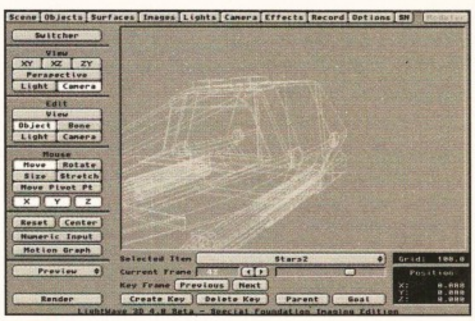
1 ***Here's a good starting place for the Pod's motion. In LightWave, the left mouse button moves along the X and Z axis, while the right button allows movement along the Y.***



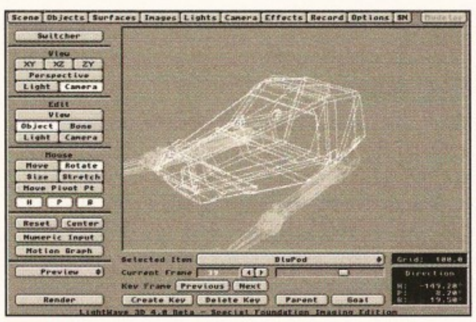
2 ***Layout's top view. From here you can move objects (including lights and the camera) along the X and Z axis for more precise placement. The dotted lines coming from the camera show you the (adjustable) field of view. This lets you know what will be visible from the camera without actually looking through it.***



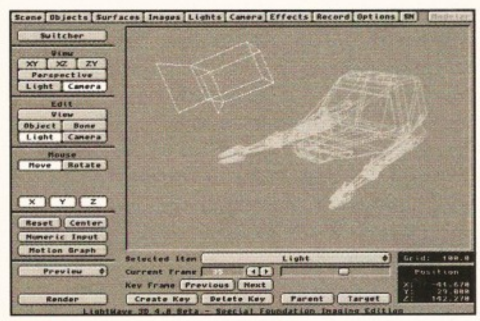
3 ***The middle of our Pod's motion. This isn't a keyframe position – it's just here to give you a better understanding of the direction it's meant to be moving in. In fact, this image serves almost no useful purpose whatsoever and there is absolutely nothing else that can be learned from looking at it.***



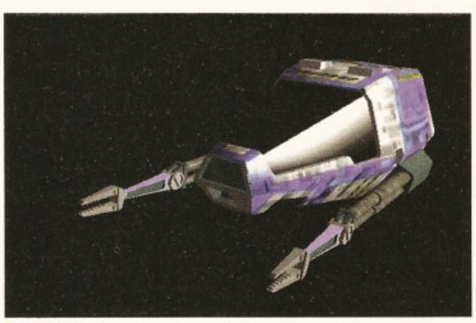
4 ***This is almost where the last keyframe should be. The last frame would be useless to show you since the Pod is off the screen at that point. However, there is valuable caption space left for me to fill. I can't think of anything clever to say, so it may be best for me to just not write anything at all.***



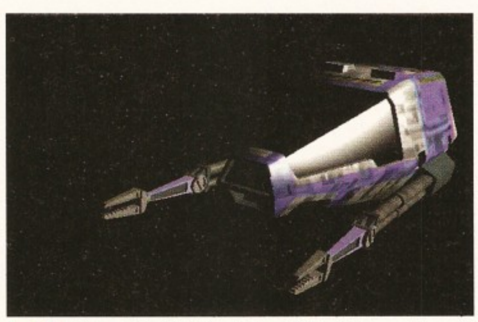
5 ***Ah! Something new! This is what the Pod would look like at this point if the last keyframe had the object banking. A motion like this not only adds a touch of excitement, is allows the light and shadows to move across the object's surface, making for a prettier shot.***



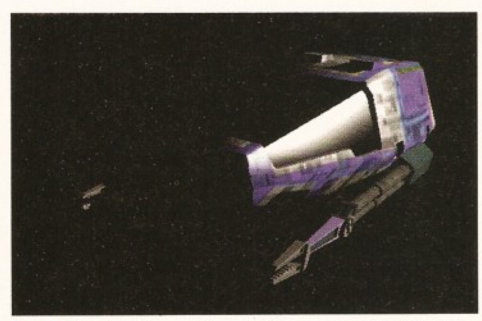
6 ***This is the light position used for the colour images. Although it's not facing the Pod, the object will still receive light since this is a distant lightsource. That means that the light simply points in the direction from which the light shines – almost like an arrow (with barn doors instead of a point).***



7 ***Without any adjustments, we can see that there is simply too much light hitting the Pod. While this may be fine for a show like Star Trek, we prefer more realistic, contrasty lighting for Babylon 5.***



8 ***When the fill (ambient) light is reduced to zero, true blacks emerge from the Pod and it begins to look more realistic. In some cases, fill light may be necessary to see important details on a side of the object not hit by light. On B5, we usually use a low blue fill and add a nebula in the background so it has an apparent source.***



9 ***Perfection at last! It may be a bit dark, but we like it that way! Besides, space is a dark place and deep shadows make objects appear more as if they really are in space. One day, when all of us travel through the cosmos regularly, people will remark that Babylon 5 got it right after all.***

Dynamics

76 like at a full 30 frames per second. In this case, the wireframes should be created quickly, since the Pod is a relatively simple object. However, in a scene involving many complex objects, the computer's ability to draw these frames slows down considerably. In fact, we often get through several chapters of a book waiting for previews to finish on Babylon 5!

In a case like this, a good idea is to create a preview of every other frame (a frame step of 2 in LightWave's preview menu will do this). When it's finished (in half the time), play it back at 15 frames per second. It won't be as smooth as 30, but you'll still get a good idea of what your animation will look like with the proper timing.

If you want to spice up an otherwise boring motion, try rotating the bank (side to side) of the Pod about 30 degrees on the last keyframe (figure 5). This will make the Pod spin as it comes towards us. The finishing touch would be to move the camera as well (something we always do on Babylon 5).

If you choose to do this, make sure you set a keyframe for the camera at 0 first. Then, at frame 60, try panning it a little to the left (heading rotation) as if it's slightly following the Pod. Adding a slight bank to the camera (perhaps -5 on frame 0 and +5 on 60) also adds a nice sense of vertigo to a space scene. Try creating a preview first without and then with camera motion – you'll see what a big difference it makes!

At this point, you should be more or less finished with the animation part of this simple scene. When you're satisfied with your work, make sure you save it!

Can you see

Now it's time to get out of the director's chair and become the lighting man. Most 3D programs feature several types of lights. The most often used and only important one for this lesson is the Distant Light, which mimics a single, far off light source (such as the sun). Click on the light button and you should see it appear. If you can't see it (or it's too big), use the mouse to move it into a better location. If it still seems to be hiding, check out one of the three direct views and zoom out until you find it, then move it into a position so you can see it from the camera view.

The position of this particular light source has no meaning. All that we are concerned with is its rotation, since this determines from what direction the light shines. As shown in figure 6, a distant light can be placed so as to not even face the object and it will still work – all that matters is direction (a spotlight, on the other hand, needs to be positioned as you would a real spotlight – facing the object at whatever angle suits your fancy).

In this case, we want the light to hit the object from the right side, so the light has been rotated at a sort of 3/4 angle towards the left (facing left means sun will shine from right – I hope this isn't confusing you). Figure 7 shows what this looks like rendered (a middle frame has been chosen so we can clearly see the Pod).

This first try is OK, but the Pod looks sort of stuck on to the backdrop – it doesn't seem as if it's really in space. Believe it or not, this can be fixed entirely through proper lighting.

First of all, go to the lighting menu and examine the ambient (or fill) light section. This sort of light comes from all directions and is meant to fill in dark areas to prevent any part of the image from being completely black. In figure 7, it's set at 25 per cent. In many cases this wouldn't be a problem, but in space, very little fill light exists. Many surfaces are completely black. So, we reduce this down to zero and try again (figure 8).

Ah, this is much better. The contrast has increased and many areas have got darker – it looks much less 'stuck on'. It's still missing something, however. It's missing perhaps the single most important element that makes 3D animation look so realistic – shadows. By turning on the Ray Trace button (hit 'Trace Shadows' under the camera menu in LightWave), shadows will automatically be calculated and objects will cast shadows on each other and even on themselves. Figure 9 shows the finished product.

It's dark

There are probably two things you noticed right off the bat after rendering with shadows. No, the right arm of the Pod has not vanished – it's just under the shadow of the Pod's body (if you turn up the ambient light, it will begin to reappear). However, as the object moves (especially as it rotates) during the animation, the shadow will move across the object and crawl along different surfaces.

I'm sure you also noticed that the render time went way up. That's because Ray Tracing takes a lot of computing power. LightWave has to look at the lightsource, then the object, figure out which areas of the object are hit by the light, then calculate which areas behind the object should be blocked, etc. That's what Ray Tracing means – it traces the path of every ray of light and decides exactly what it should do. Shadows may look nice, but they have a price!

Another type of shadowing is called Shadow Mapping (supported by LightWave, but not all 3D programs). This is actually a form of 3D 'cheating,' in which a shadow is not actually cast by an object, but drawn over objects. It takes far less time to calculate, but requires a chunk of memory to draw the shadow, depending on how accurate and clear you want the shadow to be. In the end, you have to sacrifice either time or RAM to reap the benefits of true 3D realism. This is something I will discuss in a future issue.

Now what?

After you've rendered a few test frames (usually first, last and middle) to make sure the animation will go as planned, you need to actually create an animation! The first step is to render all your frames. In normal Amiga resolutions, each high-res frame can take anywhere from 200K to almost 1Mb per frame, meaning you need quite a bit of hard drive space to store even a modest scene.

However, utilities such as PEGGER will compress your frames into JPEG format as they're rendered and saved. While this will let you store close to 10 times the number of frames, keep in mind there will be a loss in quality depending upon how much compression you utilise.

Turning all these frames into a moving sequence is the tricky part. The Amiga (or any other computer) is not capable of playing back 24-bit, high-res images at 30 frames per second. In the professional world, people usually buy a single frame controller and an expensive video deck to record their rendered frames one at a time. Newer technologies (such as the Personal Animation Recorder – PAR – board) use their own special compression schemes to play back 24-bit animation at 30 frames per second. The quality is very good and costs much less than the single frame solution, though it still requires at least £1,500 and an Amiga 2000.

For those of you on a tighter budget who aren't interested in broadcast quality, there are a number of Amiga animation utilities that will allow you to create some pretty decent-looking animations that can be output to tape with a cheap video encoder, or straight out of the back of an A1200.

Perhaps the best (and the one we use for all of our Babylon 5 tests) is REND 24, an easily obtainable shareware program by Thomas Krehbiel. It will load a sequence of 24-bit (or JPEGed) frames and create an Amiga anim5 out of them, at whatever resolution you ask (from two colours to HAM-8). It has a very good dithering routine built in that makes regular HAM (or even fewer colours) look their best. On B5, we usually create tests in low-res HAM overscan. They are then converted into the new ANIM7 format (for faster playback) and usually playback, even full screen, at close to 30 frames per second.

Believe it or not, these little 'previews' look great and are possible on any Amiga, without even a scrap of fancy hardware. They are certainly good enough for the hobbyist to throw on to their demo reel. We at B5 often wish people would use this technique on the poorer videos we get! Just throw a few of these easy-to-make anims on to tape and, before you know it, you'll have a job in 3D animation to help you pay for the single-frame equipment.

The end (?)

The three Ds of animation are only the beginning. As anyone who has even just seen screenshots of LightWave can attest, there are plenty more features to learn and I have only scratched the surface. However, Modeling, surfacing, lighting and animation are the core of all 3D work. A good understanding of these elements is all anyone needs to become a good animator. Brush up on these before you sink your teeth into the little details and perhaps it will be you writing the next article for Amiga Shopper... ■

Connect up

Dave Winder *(Wavey Davey) offers a brief explanation of the Internet and how it works for beginners to the scene and then busts jargon like never before. He also has some very hot news from CIX.*

The greatest percentage of my electronic mailbox is taken up by people requesting explanations to on-line jargon. So in response to your pleas, here follows the biggest and best on-line jargon buster you will ever find!

How to get going on the Internet

The Internet is a network of computer sites linking millions of people the world over. You can use the Internet to carry electronic mail (Email) messages to anyone in the world who has an Email address. For example, you can send us messages at Amiga Shopper by addressing them to: amshopper@cix.compulink.co.uk. You can also download software and take part in group discussions on the Internet.

Using the Internet is completely free, although gaining access usually isn't, unless you are at university of course. Dial-up access will typically cost you around £10 a month, with your telephone bill on top of that.

To get started on the Internet you need three things, an Amiga (which we are presuming you already own), a modem and a telephone line. The faster the modem you use the better – a 14,400 baud modem is recommended (try calling Silica on ☎ 0181 309 1111 for a price list).

One of the most popular Internet providers is Demon Internet Ltd, Give them a call on ☎ 0181 349 0063 or Email them on Internet@demon.net to find out which Internet services they provide.

If you want to find out more about the marvellous Internet, check out Amiga Shopper issue 40 (see page 114 for back issues) in which Dave Winder explains life, the universe and the Internet... or something.

AmigaNet
A network of Amiga based BBSs, operated along the same lines as Fidonet.

ANSI
The American National Standards Institute, responsible for the approval of standards in many differing areas. Most commonly used to refer to a protocol implemented by many Fidonet BBSs.

Anonymous FTP
A form of "File Transfer Protocol" which allows users of the Internet to access a public FTP archive in order to retrieve Public Domain or Shareware files. The Aminet site is a good example of an Anonymous FTP site.

Archie
An Internet tool which is used to locate files that are stored on Anonymous FTP sites. Files are located by entering a keyword for Archie to search for, and then information detailing the exact filename and directory path is returned.

ASCII
American Standard Code for Information Interchange, it refers to a code which is universally supported to represent letters, numbers, and special text characters.

Backbone
The Fidonet uses a "backbone" as the main method of connectivity and distribution. If you like, this is the main artery which supplies the lifeblood to the Fidonet system.

Bandwidth
Most commonly used to refer to the amount of "traffic" – messages or postings – to a Usenet Newsgroup or other on-line conference area or system. (The term bandwidth really means the difference in Hertz between the highest and lowest frequencies of a transmission channel.)

Baud
Often wrongly defined, a baud is a measurement that denotes the number of transitions in a modem signal each second.

BBS
A BBS is shorthand for Bulletin Board System.

Bit
A bit is a unit of measurement that refers to one character of data, so it is also by definition the smallest unit of computer storage.

Boss
The node on a Fidonet network responsible for a point or points. A boss delivers mail to and from points and the rest of the Fidonet network.

BPS
Bits Per Second, or the speed at which bits are transmitted.

Carrier
The act of establishing a connection, by telephone and modem, to an on-line system. Hence when a connection is lost you are said to have "dropped carrier". The technical definition is a signal of continuous frequency capable of being modulated with another information carrying signal. Er, yeah, right.

CIX
The biggest UK on-line conferencing system. CIX offers Internet access as well as thousands of conferences, file areas, on-line shopping etc.

CommUnity
The Computer Communicators' Association, established to protect and further computer communications in the UK. See Amiga Shopper 45 for the full picture (see page 114).

Compuserve
The world's biggest on-line system with more than 2 million users. Offers everything that the on-line user could wish for, but at a price!

Cross Post
To send the same message to more than one Usenet Newsgroup. This is generally thought to be OK, providing that the message is relevant to the groups concerned and that it is done in moderation. However, if a message is posted to lots of Newsgroups then this is known as "spamming" and is certainly not acceptable.

Cyberspace
A term invented by the science fiction writer William Gibson in his novel Neuromancer to describe a civilisation where people could "jack into" a central computer network to get information. The term soon became popular to describe such "virtual worlds" as exist within computer networks, such as the Internet.

Delphi
Delphi are one of the "Big 5" online systems in the USA, and also now operate a UK service. Owned by Rupert Murdoch's News Corp., Delphi offers on-line newspapers, forums, and easy Internet access in one tidy bundle.

Demon
Demon Internet Ltd were the pioneers of cheap Internet access for the UK. They are one of the biggest of the UK service providers, and are at the forefront of this ever growing technology. Demon also deserve praise for being one of the few of the service providers in the UK to cater for Amiga users.

Echo
A message area on a Fidonet BBS. Similar in

concept to a conference (CIX) or forum (Delphi, Compuserve).

EFF
The Electronic Frontier Foundation is the USA equivalent of CommUnity, although much bigger and established for a number of years.

Electronic mail (E-mail)
Electronic Mail is without doubt the most popular on-line resource. E-mail is the same as traditional land based postal systems, except that is much faster, cheaper and more efficient.

FAQ
A "Frequently Asked Question".

Fidonet
A world-wide network of Bulletin Board Systems, wrongly seen by many as being an "amateur" network. Most comms users have until recently been introduced to the scene by way of Fidonet BBSs, however this is changing fast and more and more people are now getting to the Internet before anything else.

FTP
The Internet "File Transfer Protocol" used for transferring files over the Internet.

Gopher
A menu based Internet resource that enables users to explore the Internet and find relevant information as requested by "keyword" searching methods.

Hacker
Someone who, simply, enjoys exploring computer systems. Always given a bad press by the media, often used in connection with criminal activity.

HTTP
"HyperText Transfer Protocol" is used to refer to the method of transferring information over the World Wide Web. If you see a URL which starts with "HTTP" you know that it refers to the World Wide Web.

Host
A computer that allows users to communicate with other computers over a network such as the Internet.

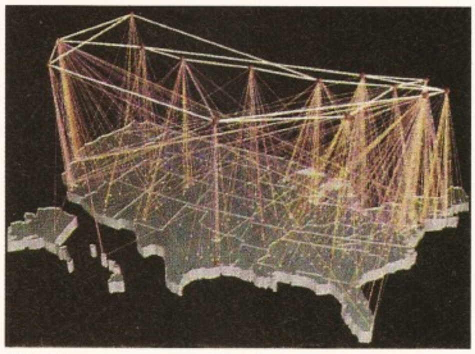
Internet
A worldwide network of computer networks. Often referred to, wrongly, as the Information Superhighway (in fact the Internet is just a part of this). There are around 30 million people connected to the Internet, growing at a rate of 1 million every month. Recent figures suggested that if the current growth rate continues then everyone on the planet will be connected to the Internet by the year 2003.

IP
IP is the "Internet Protocol" upon which the whole damn thing is based.

IRC
Internet Relay Chat is like CB Radio for the on-line community.

ITU-T
The International Telecommunications Union – Telecommunications. A body which deals with many standard approval matters, for example the "V" numbers that are connected with modems. The ITU-T replaces the old CCITT with which you may be more familiar.

Janet
The "Joint Academic NETWork" which is the network that most of the educational establishments in the UK, at least at college and University level, are connected to.



The Internet, a graphical representation FTP'd from the Internet, where else?

Line Noise
The disruption of computer communications by interference on the telephone line, can be caused by many external factors.

Listserv
A computer program that automatically administers an Internet mailing list. Very clever, and very useful as well. Like me really.

Lucy
Toby Simpson's off-line reader program for CIX.

Lurker
Someone who reads on-line messages but doesn't send any. A sort of on-line voyeur.

Mailing List
An on-line discussion group, usually associated with the Internet, whose messages are distributed solely by E-mail.

Modem
The box of tricks that enables you to enter the world of cyberspace. A modem converts the binary information from your computer into an analogue signal that the telephone can deal with, and vice versa at the other end.

MUDA
"Multi User Dungeon" is an on-line game that can be played by many users at the same time, in real time. Originally referred to text based adventure games, but now applies to any on-line multi player adventure.

Netiquette
The un-written, yet largely accepted, etiquette that applies to users of on-line systems, especially Usenet and the Internet.

Newbie
A newcomer to Cyberspace, applies particularly to Usenet.

Nicola
Probably the most popular of the Amiga off-line readers for CIX that are not written by Toby Simpson.

Node
A computer that is attached to a network.

Off Line Reader
A program that saves you money by reducing the time you spend on-line, and therefore connected to the telephone, and allows the user to perform many tasks off-line instead.

Packet
A bundle of data. Simple. Well not really, but you don't want to know any more, believe me.

QWK
A method of bundling e-mail into packets to be downloaded and read offline. Very popular with users of Fidonet BBSs.

RFCA
"Request for Comments" document allows for discussion on Internet standards.

Serial Port
The port on your Amiga that allows it to communicate with other things, such as the outside world.

Signature
Also known as a "Sig File" this is part of a message which gives your personal details, or "signature". Long sig files are often the subject of much on-line hatred, and so many anarchic users post them to be awkward.

Smiley
Horrible little things that are supposed to convey emotion using text characters that form little faces.

Snail Mail
What users of e-mail call traditional postal methods due to the comparative slowness.

Sysop
A system operator, the person who runs a BBS.

TCP
The "Transmission Control Protocol" which is one of the primary protocols upon which the Internet operates.

Telnet
An Internet protocol that allows you to use another computer remotely.

TLA
A "Three Letter Acronym", although often with more than three letters or not really an acronym at all". A sort of on-line shorthand designed to make typing quicker and on-line time shorter.

UNIX
The operating system upon which much of the Internet runs.

Usenet
Something like a massive, sprawling BBS. The place on the Internet where discussion groups on every possible subject exist. Very popular with students and journalists. ■

Hot news from CIX

CIX has announced plans to provide its subscribers with dial-up SLIP/PPP access to the Internet. Charges will be competitive, I am assured, and the system will be available to users from February 1995. The introduction of SLIP/PPP will enable the use of graphical World Wide Web browsers and users will be able to produce their own home pages.

A program has been written by CIX programmer, Paul Gardner, to allow the creation and editing of Web pages. There will be a low charge for this service. Newly installed hardware promises the fastest dial-up WWW access in Europe, and special caching software will ensure the minimum of delay whilst browsing from site to site.

CIX have also announced 24-hour telephone technical support. Matthew Sims, General Manager at CIX, explains "the Internet is a 24-hour service, and CIX offers 24-hour access to the Internet. We find it only fair that our customers be provided with corresponding support".

End game

Cliff Ramshaw *rounds off his chess programming tutorial with a look at how your program's playing ability can be improved. For our new readers, the complete series can be found on the ShopperChoice Coverdisk.*

This is, sadly, the final instalment of my chess programming tutorial. I'm going to show you how the program's game can be improved with only relatively minor alterations to the code. But first, there's some tidying up to be done...

So far, the program doesn't recognise that a game has ended. Once the computer has you in a checkmate position, it will take your king before taking all your other pieces.

If the failure to halt at the end of the game was the only consequence, it wouldn't be so bad – you can always break out of the program with [Ctrl-C] – but it introduces a peculiar bug that you may have noticed if you've played last month's version to the end.

The bug only manifests itself when you place the computer in check (or checkmate). In some circumstances, one of the possible responses open to the computer is to put your king in check. It sees both kings as being equally valuable, and reasons that if you are about to take its king, then it will take yours and the exchange will have been an even one. In order to get round this, we need to add some code that explicitly looks out for check and checkmate situations.

First change the way the bestmove() algorithm sees the values of the opposing kings. Insert the code in listing 1 into the recursive part of bestmove(), just after the line:

```
current.score=-opponents.score
```

or, in AMOS:

```
CURRENTMOVE(5)=-SCORE
```

On the Coverdisk 2

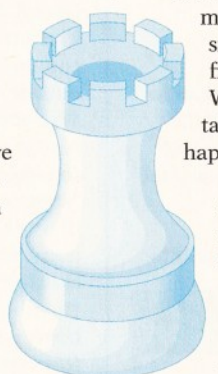


The complete series of our popular chess programming tutorials can be found, listings and all, on this month's ShopperChoice Coverdisk.

The days of tedious typing are over!

The code is only executed if bestmove() is acting on behalf of the player, not the computer. It checks this by seeing if 'level' is an even number (remember that an even number divided by two has a remainder – found by the modulo function – of zero). A further criterion to be met before the code is executed is that the taking of a king has been anticipated (the variable 'taken' has a value of 6 in this case).

If this is the case, then 'score' is increased by 1,000. This effectively ensures that the score for a player taking the computer's king is much greater than that for the opposite situation – it prevents the computer from attempting an exchange of kings. We further check to see if this taking of the computer's king is happening at level 2.



If so, the computer will put itself in checkmate if it makes the move being checked at level 1 of the recursion and of which the current move is a consequence. If it is checkmate, then 10,000 is added to its value. This value is multiplied by -1 when it is returned to level 1 of the recursion, so the computer will consider the move that caused the checkmate with extreme caution.

With these score adjustments safely in place, we can now modify the main loop to read them and inform the player of check and checkmate situations accordingly.

The modified version of the loop is shown in listing 2. The first check is to ensure that the computer's score is larger than -5,000. If it isn't, then we know that the computer has been forced to choose a move that will leave its king open to attack from the player – in other words, it is in checkmate. In this case, the loop is closed and execution halts.

Otherwise, the move is made and displayed on the screen as before. If the score for this move is 500 or greater, this indicates that the computer is in a position to take the player's king with certainty (the king has a value of 1,000 – more than double the sum of the other pieces) – it has the player in checkmate. If so, the loop is again closed and the game ended.

Otherwise, the computer first checks to see whether it has the player in check before accepting his or her move. It does this by making a further call to bestmove(), this time looking only one move ahead. If the score retrieved (stored in a separate move structure, checkmove, because we want to keep the contents of computermove – CURRENTMOVE, in AMOS) is 500 or greater, then it is possible for the computer to take the player's king – the player is in check, and a message is printed to the screen to say so.

Either way, the player's move is accepted and displayed before a test is made to see whether or not the human has put the computer in check. This test is analogous to the one just discussed, except bestmove() is called with a player argument of -1, indicating that it should search on behalf of the human rather than the computer.

Finally, the loop closes, the only exit conditions being checkmate for either computer or human, according to the value held in computermove.score (TEMPMOVE(5) in AMOS). Once the loop finishes, the message 'checkmate' comes up before the program quits.

Home improvements

So, now that we have a fully working chess program, how can we improve it? If you've played more than a couple of games, you'll have noticed an irritating pattern in its opening moves. It always first advances the pawn that begins in square A2. It does so because at that stage of the game, all of the moves have an equal score – unless it's looking quite far ahead, it won't anticipate taking or losing any pieces, so all moves will be assigned a score of zero. When faced with several moves all with the same score, the computer defaults to the first one that it examined – the pawn in square A2.

We can get around this by storing some opening moves. These are pre-set patterns of attack that have been developed over many years of chess playing. The moves generally bring pieces towards the centre of the board, making an early bid for control and creating tension. After making two such moves, the computer can see that some further moves will lead to pieces being taken in the future, even if it is only looking three plays ahead. The game immediately becomes more exciting.

The necessary information can be held in a structure of type move (a 7- element array in

AMOS). The final version has been modified to act on one of two opening gambits, each of which consists of a pair of moves: white's first and second moves; black's response is ignored. The moves are stored in a two-dimensional array: one dimension for the two choices, another for the pair of successive moves accompanying each gambit.

The decision of which gambit to use is made at the start of the game by calling the random number function – the final version asks the user for a random number seed at the beginning of the game to ensure the same opening move isn't chosen each time. Another new variable, 'nummoves', keeps count of the number of moves made so far. It is used to access in turn each of the pair of moves stored in the openings array. You can see how this is implemented by looking at the modified beginning of the main function in listing 3 on Coverdisk 2 (note that the necessary line that adds 1 to nummoves is missing – it appears just inside the end of the main loop in the listing on the Coverdisk 2).

The 'openings' array that contains the moves needs to be declared at the top of the program along with all the other global variables; it is initialised within the setupboard() function – see the listing on the disk for details. By increasing the size of the first dimension of this array, initialising the new elements appropriately and increasing the size of the random number generated to choose from the gambits, you can add your own opening moves to the game.

The game can also be made more interesting by increasing the sophistication of the evaluate() function. The score of a position could be increased for every free square around the king, thus favouring positions that give the king greater mobility. You could also decrease the score for every row that doesn't have a pawn in it and for every row that has more than one pawn in it, based on the theory that, although a pawn gains a material advantage when it moves diagonally to take a piece, it detrimentally affects the line of defence.

The implementation of both of these things is very straightforward. The modified evaluate() function is shown in listing 4 (on Coverdisk 2). The pawns are kept track of by two flags: 'previouspawn' and 'currentpawn'. 'Previouspawn' is used to remember whether a pawn has a neighbour in the row to the left of it; 'currentpawn' to check on the presence of more than one pawn in the same row.

Dealing with the king is just as simple. Its coordinates are noted when it is found. Then, after the board has been otherwise completely evaluated, the score is increased for every square surrounding the king that is empty – this is achieved by a straightforward series of 'if' statements.

Looking ahead

Because the program only looks ahead to a certain depth, it is always susceptible to the strategy of sacrifices. If it's only looking 3-ply ahead, then it can be beaten if you're prepared to sacrifice pieces for gains that won't be realised for another two moves. The solution is to increase the level of ply, but that's severely limited by the speed of your machine.

A compromise is to increase the level of ply for any move under examination that involves taking a piece. This will ensure it doesn't fall prey to the more obvious sacrificial ploys. I've modified the final version of the program so that it increases the level of ply by two whenever it's considering a taking move. This increase in ply only occurs at the first level of recursion, when the computer is considering its immediate, rather than future, moves.

Implementing this only needs a couple of extra lines in bestmove(). The following replaces the previous 'opponents=bestmove(-player,level+1,maxply)' line in bestmove()'s recursive segment:

```
if (taken!=0 && level==1)
opponents=bestmove(-
player,level+1,maxply+2);

else
opponents=bestmove(-
player,level+1,maxply);
```

And here's the AMOS version:

```
' if we're taking a piece and are at the
top level of recursion, then
' increase depth of search by 1 ply
If TAKEN<>0 and LEVEL=1
BESTMOVE[-SIDE,LEVEL+1,-
BESTSOFAR(5),PLYMAX+2]

Else
BESTMOVE[-SIDE,LEVEL+1,-BESTSOFAR(5),PLYMAX]
End If
which follows on from the lines in BESTMOVE
that read:
For I=0 To 6
TEMP(I)=CURRENTMOVE(I)
Next I
```

The problem with this solution is that it slows things down considerably once the game gets underway. How can we speed it up?

There are various standard techniques for speeding a program up. You can look at frequently executed loops, checking for any calculations that can be performed outside the loop – these should be moved elsewhere, to avoid their being executed many more times than necessary.

You can also reduce the number of function calls. Programs are easier to understand when they make use of many functions, but calls to functions take time. You might, for instance, find it expedient to include evaluate() as wired-in code to the non-recursive part of bestmove(), thus saving on the very many calls to evaluate() that occur for each move that the computer makes. You could gain an even more significant speed increase by re-coding evaluate() (and bestmove() too, if you're feeling ambitious – evaluate() is a much simpler algorithm for translation) in Assembly language.

You could also try reducing the number of variables that are passed as arguments to functions, making them global instead, since these too slow things down. Be careful, though, because many of bestmove()'s variables must be local for the recursion to work properly.

All but the first of these changes tends to make your programs less intelligible, so be sure to carry them out only if you have a good understanding of the program as it stands.



Powerful pruning

There is, however, another more immediate and more elegant way of speeding up the proceedings – a technique known as 'pruning'.

Remember that last month I said that the various moves that the computer considers, and the various responses to those, and the responses to those, and so on – that these branching possibilities could be seen as comprising a tree, a 'search tree'? Well, pruning is a way of removing dead branches from the tree before they are searched, thus speeding up the overall process. The question is, how do we decide which branches we can cut off without omitting an important possible future move by doing so?

Have a look at the code before I explain. The first, recursive part of the pruning version of bestmove() is shown in listing 5. In reality, changes similar to those made in the recursive part have to be made in the base-case part too. The function prototype (in the case of C), and all calls to bestmove() now need an extra argument – the cut-off value. When bestmove() is called from the main loop of the program, the cut-off value is arbitrarily high: 99999.

The code works as follows: when bestmove() is doing its stuff, checking each available move, one at a time, it keeps a track of the best scoring move so far. The process continues so long as this best score is less than the cut-off value, which it always will be at the first level of recursion, because no move can create a score larger than 99999. When bestmove() is subsequently called recursively, though, the cut-off argument that is supplied is equal to the value of -1 multiplied by the best score so far.

This means that the next level of recursion will terminate as soon as a move is found that comes with a higher score than this new cut-off value. We can do this safe in the knowledge that no further moves need be searched at this level. Why? Having found a move with a score equal to or higher than the cut-off value, we know that the second level of recursion will choose either this move or one with an even higher score. We also know that when this move is passed backwards to the first level of recursion, its score will be multiplied by -1.

We already know that the cut-off value is equal to -1 multiplied by the score of the best move so far, so therefore the score of this new move under consideration *must* be less than, or equal to, the best score so far – in other words, it, and all its consequences, can be ignored. A similar process occurs for every level of recursion beyond the first, successively removing unnecessary branches from the search tree.

And that brings this series to a conclusion. I hope you've had fun while learning about the program, and I hope you'll have even more fun by adding your own modifications. You'll find the listings on the Coverdisk 2. Cheers! ■

Assembler Part 6

*Have you, like **Toby Simpson**, been struck by lottery fever? If you have spent many sleepless nights working on the golden formula to win the jackpot, you should take a look at this month's Assembler tutorial.*

If you're anything like me, you never seem to have enough money. Unless, of course, you were to win the lottery. With this in mind, the best course of action is to set your computer to work and get it to generate some fool-proof lottery numbers, and then start winning. We're going to knock up some debugging routines for displaying strings and numbers. We're then going to come up with a random selection of sets of six numbers, ranging from 1 to 49, which, co-incidentally, are exactly the sorts of numbers you need for the National Lottery.

Just to prove I'm not totally obsessed, let's move off the subject of lotteries. Short of delving around in a debugger continually, sooner or later you'll wish to get information to the screen. For our present needs, simply being able to dump information to the shell window is a great help. In a lot of cases, this will be for debugging purposes, but CLI/Shell based utilities use routines like the ones we'll knock up for their input and output also.

Think back to our first Assembly language program; it showed "Hello World" on the screen. If showing information on the screen is something we'll want to do often, it makes sense to put it into a separate sub-routine that we can call many times. Have a look at this:

```
        lea    HelloWorld,a0
        jsr    PrintString
        rts
HelloWorld: dc.b      "Hello World",0
```

First, we get the address of the HelloWorld: label into the address register A0. A0 now points to the "H" of the "Hello World" string. You'll notice that there is a ',0' at the end of our dc.b statement. This has the effect of putting a byte with the contents of 0 after the 'd' of the string. We use this as a "you've reached the end of the string" marker. When our "PrintString" sub-routine encounters this, it will stop showing characters. So, how does our PrintString function actually operate? Well, as you may recall, we used the dos.library Write() function to show our original Hello World message all those months ago. Write() takes three parameters:

```
    D1    The file handle to output to
    D2    A pointer to the data to write
    D3    The number of bytes to write to
the file handle
```

We obtained the file handle using the Output() function. This returns the file handle of the default output channel. C programmers will know this as "stdout". Conversely, there is an Input() function, which returns the default input channel (stdin); which we'll come to at a later date. We have a pointer to the data we wish to write in A0, so all we need to find is the length of the string. Since we know that it is marked by a zero, all we need to do is count bytes until we reach it:

```
; Returns the length of a string pointed to
by A0 in D0:
StringLength:  move.l    #$00,d0
SL_Count:      move.b    (a0),d1
        cmp.b     #$00,d1
        beq    SL_Got_Length
        add.l     #$01,a0
        add.l     #$01,d0
        bra    SL_Count
SL_Got_Length: rts
```

This assembles to 34 bytes. Experienced Assembly programmers will laugh at the above and might come up with this code:

```
StringLength:  moveq #-1,d0
SL_Count:      addq.l       #$01,d0
        tst.b     (a0)+
        bne.s     SL_Count
        rts
```

...which is only 10 bytes, five lines, and does the same as the above. Why? The first example, although longer, should be more familiar to you. Firstly, we clear our count register D0 to zero. We then move the byte which is pointed to by the A0 register (the first character of our string) into D1. It is then compared to 0, if it is, we jump to the label SL_Got_Length, as this is the end of the string. If it is not, we add 1 to A0 so that it points to the next character, and increment the string length counter by 1, then jump back to our loop. If we called this example like this:

```
        leatest,a0
        bsrStringLength
        rts
test:      dc.b  "hello",0
```

...then D0 would be equal to 5, the length of the string in characters, after StringLength returned. Amazingly, if you use the second example of StringLength instead, you'll get exactly the same result. The second example is heavily optimised 68000 code. We have cheated as much as we can to make it as fast and small as possible. Indeed, it uses less registers also, as it does not require D1.

So, how does it work? The MOVEQ instruction works exactly like move.l, except it only moves immediate integer values from -128 to +127 into a data register. It is also only 2 bytes, whereas a move.l #xxx,d0 takes 6 bytes. So, we use this to initialise our count to -1. Then we get to our count loop. The first thing we do is increment our count register by 1 (first time around, this will therefore go from -1 to 0). Then we use the tst.b instruction. This compares the operand (the bit to the right of the instruction) to zero, and sets the Z flag if it is zero, or clears it if not.

We test the memory location pointed to by A0, and then take advantage of post incrementing to add 1 to A0 automatically for us. We then say "branch if not equal..." to SL_Count. This is the same as saying "if we're not at the end of the string, go back to the SL_Count: label.". Neat eh?

Anyway, we're wildly off the point of winning money, and showing strings on the screen for that matter. Using the above little StringLength routines, we're able to find the missing parameter for our dos.library call to Write(). Check this out:

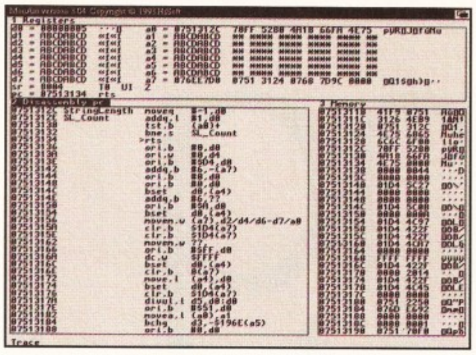
```
PrintString:    move.l   a0,d2
        bsr       StringLength    ; Get
length of string
        move.l    d0,d3
        move.l    STDOUT,d1
```

Listing continued ▶

On the Disk



You'll find the complete listings of our Assembler tutorials and text files on ShopperChoice – Coverdisk 2. No more typing!



Using MonAm to test that our StringLength function works. Note the content of D0.

```
        DOS     Write       ; Show string☛
on STDOUT
        rts
```

Yes, that's it. With the StringLength routine already written, the above is all we need to show strings on the screen. Of course, it assumes we've already found the output handle and put it into STDOUT. Listing 1 (found on this month's coverdisk) shows the full program, both routines, and some test code to show a couple of strings on the screen.

You may notice that we've added a 10 before our 0 at the end of each string. 10 is the ASCII code for line-feed, it just assures that we proceed to the next line after showing the string. You can incorporate any ASCII code, or control character in this way. For example:

```
        lea     ShowInBold,a0
        bsr     PrintString
        rts
ShowInBold: dc.b        27,"[1mI bet this is☛
in bold",10,0
```

This uses an Amiga ANSI printer sequence on the screen to turn the string into bold-face. Somewhere in your Amiga manuals are the rest of the codes, which include colours, italics, underlines and so forth.

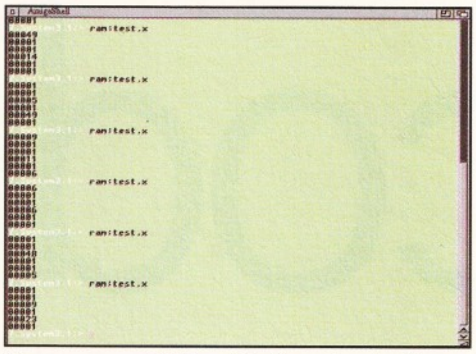
Showing strings is all well and good. What happens when we wish to show numeric information on the screen? This is harder, as we have to convert numbers into ASCII, and then show the string. A quick delve back to high-school days should clear things up a bit. Let's say we are writing a routine which will show the contents of the D0 register on the screen in decimal, up to four digits in length.

Do you remember 1000s, 100s, 10s and Unit columns? You don't? OK, elementary revision time. If we had 5678 in D0, how would we convert this to ASCII? Well, 5678 is four digits long, and will end up as being a string four characters long. So, let's deal with it character by character, left to right. The first column is the 1000s column. We simply divide the number by 1000 and see how many times it goes. In this case, five. That's our first digit.

The ASCII codes for the numbers 0-9 conveniently range from $30 to $39 (In hex, which is what the $ means in case you've forgotten). So, we add $30 to the result and store this out as the first character. We then multiply our 5 by 1000 and subtract this from the total. This leaves us with 678.

We now divide this by 100 and see how many times that goes, 6. Add $30, store it out as the next character, multiple our result (6) by 100 and subtract from remaining total, leaving us with 78 and so forth, with 10s and, finally, 1s. Here's a little listing:

```
ShowDecimal5:  moveq #$04,d1
      leaSD5_Dividors(pc),a1
      leaSD5_Number(pc),a0
;
; ---- Create our number string ....
SD5_Loop:   move.l    (a1)+,d2
      divu  d2,d0
      add.b #$30,d0       ; Turn result to☛
ASCII number
      move.b   d0,(a0)+ ; Put character to☛
output buffer
;
      swap  d0
      and.l #$ffff,d0     ; Get remainder.
;
      dbra  d1,SD5_Loop ; Loop round doing☛
all digits.
;
; ---- All done, show our number on screen
....
      leaSD5_Number(pc),a0
      bsrPrintString
      rts
;
; ---- Dividor table & data for the decimal☛
routine ....
SD5_Dividors:  dc.l  10000,1000,100,10,1
SD5_Number: dc.b   "00000",10,0
```



If you can port listing 1 to C and make it as fast as this, Toby will eat a Hammond organ.

To be really awkward, I have introduced a few new concepts. Most of them will make absolutely perfect sense, now that we know what the routine is meant to do. First, a couple of things to note. You'll see we've included (pc) in our two LEAs. As long as the label we reference is within 32K (32768) bytes of the LEA instruction, then this instruction will generate better code. This is called relative addressing, and we'll look into it in more detail next month when we delve back into the grindstone.

Meanwhile, imagine (pc) isn't there. Load the address of a look-up table into A1, which points to 10000, 1000, 100, 10 and 1. We read these numbers in, one at a time, and divide by our value. Then add $30 to the result and store it out, generating our ASCII string of numbers.

Then, taking advantage of a side effect of the DIVU (Divide Unsigned) instruction, we can use SWAP to get the remainder of the division back into D0. When you use DIVU, the result of the divide is stored in the lower 16 bits of the result register (the .W bit) and the remainder in the top 16 bits.

SWAP simply swaps the top and the bottom words around, thus bringing the remainder back into the main part of D0. We then logically AND it with $ffff to just keep the remainder and away we go for the next loop. Logical ANDs are something we'll look into next time around, but for now, if you AND two things together, then each bit in the two parameters are compared – if they are both 1s then the result contains a 1. If not, it contains a 0. Basically, we're getting rid of the word we're not interested in, and keeping the one we are – in this case, the remainder. To clarify, look at this example:

```
            $12345678
ANDed with..   $0F0F0F0F
... is:        $02040608
```

The final new thing we use is the DBRA instruction (Decrement and Branch Always). Read this as "Decrement the specified data register, and if it is not -1 then jump to the label specified. If it is, ignore this instruction and carry on to the next".

As with BRA, you can also have BNE, BEQ and so on. You can do the same thing for the DB instruction. DBNE, for example, is Decrement and Branch if Not Equal. That gets a little complex, but you'll learn how useful the DBRA version is as we go along. Effectively, it replaces the following sequence of instructions:

```
        subq.w      #$01,d0
        cmp.w     #$00,d0
        bne       SD5_Loop
```

Three into one isn't bad. 68000 Assembly language is good for this sort of thing, you can optimise incredibly. Knowing about caches allows you to optimise even further, but that's a matter for a much later instalment.

The only thing we're missing now is a method of getting a random number. This is not so easy. Rather than look at a proper random number generator, we're going to cheat, and read the contents of one of the Amiga's custom chip registers, in this case the horizontal scan position. Unless you have a blindingly fast Amiga, this is likely to be very random indeed. We'll look at "proper" random number generators at a later date.

With this lot in mind, we simply loop round six times, pick six numbers, and output them as decimal values on the screen with a space between them, and hey presto, we've got more money than sense. Listing 2 (to be found on the coverdisk) shows the lottery program in its full glory. If you win, I only ask for half. Let's get rich!

As programs go, this scores only 2 out of 10. Not only has it got the tendency to pick the same number several times, but it is certainly not random. Next month, we'll update this program to use a real random number generator, and not pick the same number twice (thus increasing your chances somewhat) but we've run out of space this time around.

Should you not win, and there's only a 99.99999999 per cent chance of this happening, then tune in next month and we'll look at some wildly exciting stuff, such as binary manipulation using logical operations and shifting, along with relative addressing and a few other goodies. Unless *I* win the lottery, of course, in which case I'll be in the Bahamas. ■

C coding

Don't miss the "Cinderella" transformation of **Toby Simpson's** *C program as he makes enhancements and adds some new features – it's turning into a rather smashing application with the full listings on Coverdisk 2.*

Welcome to the latest Coverdisk-assisted instalment of the C programming course. We're safely into 1995 now, so we can get down to adding some of the nitty-gritty stuff to our Finder program without worrying too much about alcohol getting in the way. Having said that, I find a nice bottle of red wine helps considerably in general programming efforts... as long as you're over 18 of course!

The full listing to this month's Finder program and a working executable can be found on the ShopperChoice Coverdisk. The great news is that I get more space here to introduce heaps of new, cool features, such as ARexx, for example. The bad news is that I have to write more to make it fit, but that is my problem!

Time for a brief re-cap. Last month we delved into IDCMP messages and added an event handler to our program. This allowed us to look at what the user had done and act on it accordingly. We got our buttons working and the program is turning from a small utility into a decent application. This month we are going to make several enhancements and add some new features. Let's have a quick look at these:

1. ARexx. If you don't know what this is, go out and buy a good book, such as "ARexx: Your Amiga's built-in Turbocharger", published by Future Publishing (call ☎ 01225 822 511 for a copy). It costs £17.95 and I wrote it, so I'm somewhat biased in suggesting it! In a nutshell, ARexx makes it possible for your application to be controlled externally.

As long as you make the right features accessible from your ARexx interface, users can customise it to perform all sorts of things that you may not have even *thought* of. ARexx gives users a chance to make applications do what they want, rather than what the author of the application thought they would want.

2. Keyboard Short-Cuts. Using the mouse is all very well, but there are times when it is quicker for the user to press keys to make things happen. We'll take advantage of a new IDCMP message, IDCMP_VANILLAKEY, to allow us to look at what keys the user has pressed when our window is active. We can then act on these.

3. Removal of CLI dependency. Currently, the Finder program needs to be run from the CLI and parameters are also required. We needed this to get the program working and provide us with a way of making good use of it before the GUI arrived.

Since this is no longer a problem, we'll be removing this and turning the Finder into a proper Workbench tool, and even providing a rather silly icon for it (...which I drew and I am no artist, it has to be said! If you can come up with a better one, send it in to me at the usual Amiga Shopper address and I'll include it on the next coverdisk).

4. Improvements to the event handler. In order to take advantage of ARexx, we'll need to create a new message port and watch that, as well as the one which comes free with our window.

Once these improvements have been made, it will be easier in the future to add additional events to the system. Only a few lines of code will need to be changed, rather than having to make major changes like we'll have to this month. Sounds great doesn't it! Time to dive straight into it.

Deliberate error

Firstly, did anyone spot the deliberate error in last month's program? Well, I didn't, for a start. You may recall we have a function called NotifyFind() which counts any matches which occur, and adds them to the screen list.

This routine increments a counter called "files_matched". We took advantage of this routine to print further information in the list, such as the search parameters and the total match count, without remembering that NotifyFind() will generously count these for us also.

We've patched out this bug, this time by changing the line which outputs the final parameters to this:

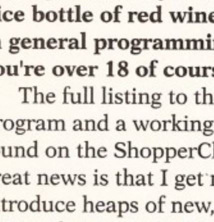
```
sprintf(work_string, "-- %ld matche(s) ☛
found", files_matched - 3);
```

This is not the most ideal fix in the world. For a start, it is hard-coded. Every time we change the number of lines that are not matches (more headers, status and so on), we have to change this value or the results will be wrong.

A good potential fix to this is for NotifyFind to take an additional Boolean parameter. If this was TRUE, the match would be counted; if it was FALSE, it wouldn't be. We'll reserve this for next month when we tie up the loose ends a bit.

Let us start by removing the CLI dependency. This is quite easy. All of the code which deals with this is in the

On the **Coverdisk 2**



The listing for this month's C programming course is on ShopperChoice – Coverdisk 2, in the "Finder" drawer. This drawer also contains the executable, so those of you without compilers can see what we've been up to.

It has been compiled and tested using DICE-C (registered version, or that provided in Future Publishing's "Complete Amiga C" book – call ☎ 01225 822 511 for a copy) and SAS C 6.51 (from HiSoft ☎ 01525 718181).

Also provided in the Finder drawer is a small ARexx program called "shell.rexx". This handy tool allows you to enter ARexx commands and see the results immediately. You should copy this into your rexx: drawer. By default, rexx: points to your S: drawer. You may wish to change this in your s:user-startup file.

You have to run sys:system/rexxmast before you can run *any* ARexx programs. The easy solution is to drag the RexxMast program from your System drawer into the WBStartup drawer. This means that it's run automatically every time you start up your Amiga, and it only takes 50K of memory when loaded. You can then run the ARexx shell from any AmigaDOS shell, using this:

```
rx shell
```

main() function. We start by removing the requirement to have the arguments passed in by changing the function definition to:

```
void main(void)
```

Originally, we then went on to grab the two arguments; one being the search drawer and the other being the initial match string. This is removed. Two functions, OpenGUI and EventLoop, expected both of these arguments to be passed in to them. We now pass blank strings, like this, for OpenGUI:

```
    if (!(OpenGUI("", "")))
        .....
```

The temptation is then to go on and remove any requirement for these arguments in OpenGUI and EventLoop. You'll often come across this in large C programs, when you start with a simple working core and work upwards as we have done. I urge you to resist this, as you are removing any future flexibility to use these features. And, it saves you typing time!

Keyboard shortcuts

Keyboard shortcuts are easy to add. We simply add a new IDCMP processing section to our event loop. When a key is pressed, applications receive one of two messages, depending on the key. If it was a standard character, such as any of the numbers, letters or punctuation, it is processed according to the current keymap and sent as an IDCMP_VANILLAKEY. The imsg->Code field of the IntuiMessage we receive contains the ASCII code of the key pressed. If it was a control key, such as RETURN, TAB, or HELP, we receive it as an IDCMP_RAWKEY. We are not interested in RAWKEYs, although should we add online help in the future (and we might, you never know!) we might become interested. In the meanwhile, we process VANILLAKEYSs only:

```
    /*
    **  User pressed a key:
    */
        case IDCMP_VANILLAKEY:
            /*
            **   We don't care about case,
            **   so set this key to lower case
            **   if it is a capital.
            */
            key_pressed = imsg->Code;
            if (key_pressed >= 'A' && ☛
            key_pressed  <= 'Z')
                key_pressed = key_pressed + 0x20;
            /*
            **  Act on key-press now:
            */
            switch(imsg->Code)

                case 'f':
/* The key for FIND has been pressed */
                GUI_Find();
                break;
            /* More code here.... */
```

There are a couple of things to note from this.

The first is that we convert all upper case characters to lower case. This is because in our program, if the user presses an 'F' or an 'f', they are treated as the same. We can take advantage of the fact that the exact difference between a lower case and upper case letter is 32, or 0x20 in hex. So, using a simple IF statement, we are able to adjust it accordingly.

The second is far more important. I've included the code we use to trigger a search in the above fragment. Instead of repeating the large chunk of code we wrote last month for when a button is pressed, I've separated it out into a new function called GUI_Find(). At the same time, some of the other code which is repeated, such as the small routine to free a list from memory containing the match strings found, has also been separated out. This makes it much easier to change in the future and it makes the code smaller and neater.

The most important development this month, however, concern ARexx.

The ARexx Interface

ARexx support is surprisingly easy to add to any application. We're already familiar with *all* of the processes involved. Just like the way we receive messages from Intuition when certain events occur, such as a button on our window or key is pressed, we can receive messages when commands are sent to our ARexx port. When we open a window, Intuition creates a message port for us automatically if we ask for it. We do this by specifying a list of IDCMP flags to OpenWindowTags.

Advanced programmers can opt for not having a port, which can lead to some neat programming techniques, such as many windows sharing the same port. Every message port created by Intuition has a unique 'signal bit' attached to it. This allows us to easily identify it and is used in the Wait() function.

The catch is that you're limited to 16 signal bits, so you'll soon run out if your program

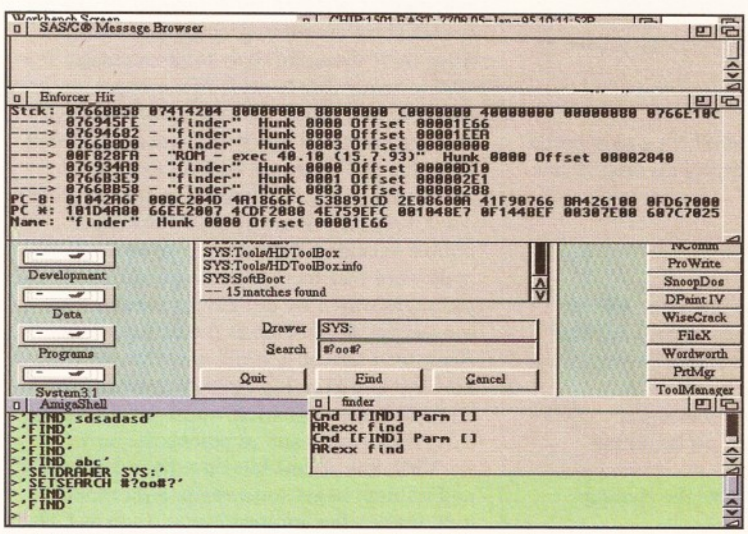
Jargon Busting

CLI
Command Line Interface. This is a low level interface to the computer. On the Amiga, this takes place through Shell windows. On PCs, this happens through MS-DOS. Macintosh-users don't get this flexibility at all without buying or obtaining other software (sometimes very expensive, indeed).

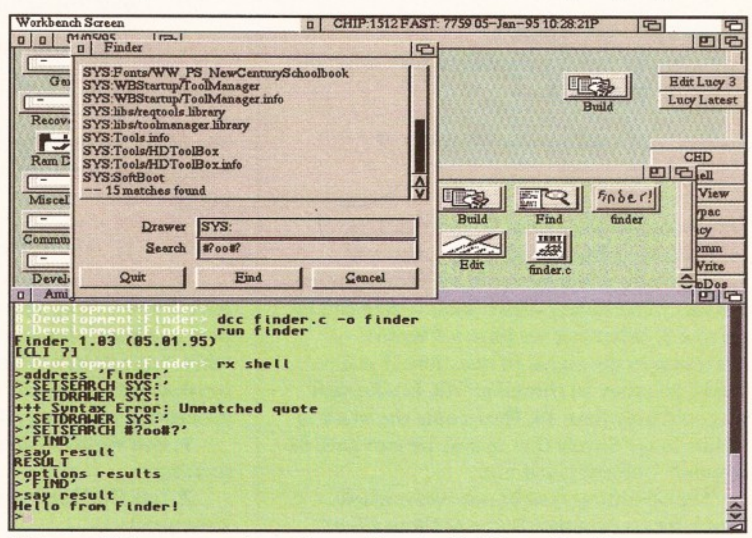
GUI
Graphic User Interface. This is the visual interface which a computer-user interacts with to make things happen. This includes mouse pointers, windows, buttons, and so on. The Amiga's GUI is called Intuition.

IDCMP
Intuition Direct Communication Message Port. This is the port through which Intuition sends messages to applications when events happen; for example, a window is re-sized or moved.

ASCII
American Standard Code of Information Interchange. Each character (letter, number or punctuation mark) and most control characters (delete, return, tab etc.) have unique ASCII codes assigned to them. The capital letter 'A' has the ASCII code of 65.



In this picture you can see me testing the ARexx interface – note the Enforcer Hit. If your Amiga has an MMU (Memory Management Unit), you can use this tool which spots illegal memory accesses.



This month's program in action and controlled from the ARexx interface! You can see here that I first compiled it using DICE, ran it and, finally, sent some test commands using the ARexx shell.

requires lots of windows. This isn't a problem in our Finder, as we only have one window, but in some applications, such as word-processors, it can be.

Back to the point in hand. To summarise, Intuition creates message ports for us. If we want to receive ARexx messages, however, we have to create our own. This is easy – we can use the CreatePort() function which is built into the linker library "amiga.lib". "amiga.lib" is automatically merged into your program at compilation time, as it contains all of the code which enables you to use the Amiga's library functions. It also contains a few goodies of its own – CreatePort is one of them:

```
    /* Open our ARexx port:*/
    Forbid();
    if (FindPort(AREXX_PORT_NAME) == NULL)
        arexx_port = ☛
CreatePort(AREXX_PORT_NAME, 0);
    Permit();
    if (!arexx_port)
        printf("Cannot create ARexx port");
        printf("An application may already");
        printf("running with a port name of");
        printf("'finder'");
        cleanexit(RETURN_FAIL);
```

The above code creates our ARexx port. You'll note that we use the FindPort() function first, just to check that it does not already exist. If it does, we may wish to adjust our ARexx port name and try again, but for now we'll just quit out if it happens.

You'll also observe that we use the Forbid() and Permit() functions around the FindPort() call. Forbid() disables all multi-tasking on the Amiga. Permit() allows it to continue. We do this to prevent anything nasty happening between us finding that the port does not already exist and us creating it.

On a multi-tasking machine it is just possible that another application could jump in between the two functions (unlikely, but it *could* happen and you should *always* deal with these possibilities). Now we have our port created, we are ready to receive messages. This involves making a few changes to our event loop.

Plenty of port

Last month's listing waited for a port using the following instruction:

```
Wait(1L << finder_window->UserPort-☛
>mp_SigBit);
```

This extracted our signal bit number (one of 16) from the window's message port, and turned it into a binary mask. This binary mask consists of 32 binary digits (bits) – each can be a 0 or a 1. Wherever we have a 1 we are interested in the signal in question. If you're awake you may be thinking: "Ah, but he said we could only have 16. How come the mask is 32 bits long? Surely that means we can have 32 signals?" Unfortunately not.

The operating system reserves a whole bunch for its own use. Some of these allow your program to detect when CTRL-C (break) is sent to it, or issued to it using the shell BREAK command. We could detect this and quit our program. Indeed, next month we will, because it is a nice touch as we finish the program off. Instead of referring to our window's signal bit directly, we'll extract it before the event loop and add it to the ARexx port's signal mask – like this:

```
    ULONG          arexx_signal,
window_signal, signal_mask, signals;
    /*
    **    Build initial signal mask:
    */
    arexx_signal    = 1L << arexx_port-☛
>mp_SigBit;
    window_signal   = 1L << finder_window-☛
>UserPort->mp_SigBit;
    signal_mask     = arexx_signal + ☛
window_signal;
```

I've also included the definitions for the various mask variables, so that you can see that we have defined them as unsigned longs, rather than longs. This is because the signal mask is an unsigned value and it could, theoretically, contain 32 1s. If this was a signed long, then 32 1s would be -1, and not +4294967295 as we actually want (0xFFFFFFFF in hex). In standard ANSI C, we define an unsigned long as just that, "unsigned long". The Amiga include file exec/types.h gives us the ULONG short-cut.

Now we have built a mask out of both our signals into the variable "signal_mask". We can now wait for this instead:

```
    signals = Wait(signal_mask);
```

We store the result, because it contains a mask of each of the signals which caused Wait() to exit. Potentially, several could happen at once (after all, the user could press a button at exactly the same time that an ARexx message was received). Then we look at this result and see which signals caused it and act accordingly. This is the code which detects and acts on the window signal:

```
        if (signals & window_signal)
/*************************************
    **
    **    Window Message(s) received.
    **
    **    Loop through processing events:
    */
    while (imsg = GT_GetIMsg(finder_window-☛
>UserPort))
        /* More code here ... */
```

For detecting the ARexx signal, we pretty much repeat the above code replacing the first IF line to say:

```
        if (signals & arexx_signal)
```

Nice and easy! So, we now open our ARexx port and watch for messages. What happens when one appears? Here is a step-by-step break-down of the actions involved in processing incoming ARexx messages:

1. Use Wait() to wait for an incoming message.

2. Use GetMsg() to receive the message structure.

3. Check the type of ARexx message. If it is an RXCOMM, then it is an incoming command, so parse it accordingly.

4. Reply to the message (using ReplyMsg), having stored any results which were required.

The first two, and the last, steps you will already be familiar with and they use the standard exec.library message functions. The third is the one that actually does the work. If you look at the code itself on the Coverdisk, you'll find it is very straightforward.

The ARexx message contains a pointer to the exact string which was sent to you. We then separate this into a command and optional parameter, and then loop through a list of valid commands, acting on them accordingly. When we have finished, if the command was not recognised, we set the result to RC_FATAL. If it was recognised, we process the command and set a result of RC_OK and send a results string of "Hello from Finder!".

Although not required, this is to demonstrate sending results back from our program to the calling ARexx program. Here is the code which performs the work of identifying the ARexx command sent:

```
    **
    **    ARexx Message(s) received:
    **
    **    Loop through processing events:
    */
    while (msg = (struct RexxMsg *) ☛
GetMsg(arexx_port))
    /*
    **    Check if it is an RXCOMM (Rexx
    **    Command) message:
    */
    if ( (msg->rm_Action & RXCODEMASK) == ☛
RXCOMM)
    /*
    **    Process this command, and
    **    grab parameter pointer
    **    also whilst we're at it:
    */

arexx_command = msg->rm_Args[0];
if (arexx_parameter = strchr(arexx_command,☛
' '))
        *arexx_parameter = 0;
        arexx_parameter++;
```

When this code has finished running, arexx_command is a char * variable pointing to the command, and arexx_parameter is a char * pointing to the parameter if it was specified. It is then a simple matter of using a SWITCH statement to process the command. After we're done, we reply to the message. It is *vital* to remember to reply to messages, or your machine may crash. At best, you'll fragment your memory real quick and lose a handful of bytes for each message you fail to reply to.

Finally, when the program exits, we remove our ARexx port. It is not quite the simple matter of calling DeletePort(), as we have to make sure that there were no pending messages which we did not get around to processing. If you look at the listing, in the cleanexit() function, you'll note that we use Forbid() and Permit() again to prevent any new messages appearing whilst we're clearing the pending ones and removing the port.

Well, lots of new bits have been introduced and it's time to get some sleep. Next month we'll make a few improvements, such as CTRL-C handling, better error messages when things go wrong, and write a couple of ARexx scripts to demonstrate the power we've added. ■

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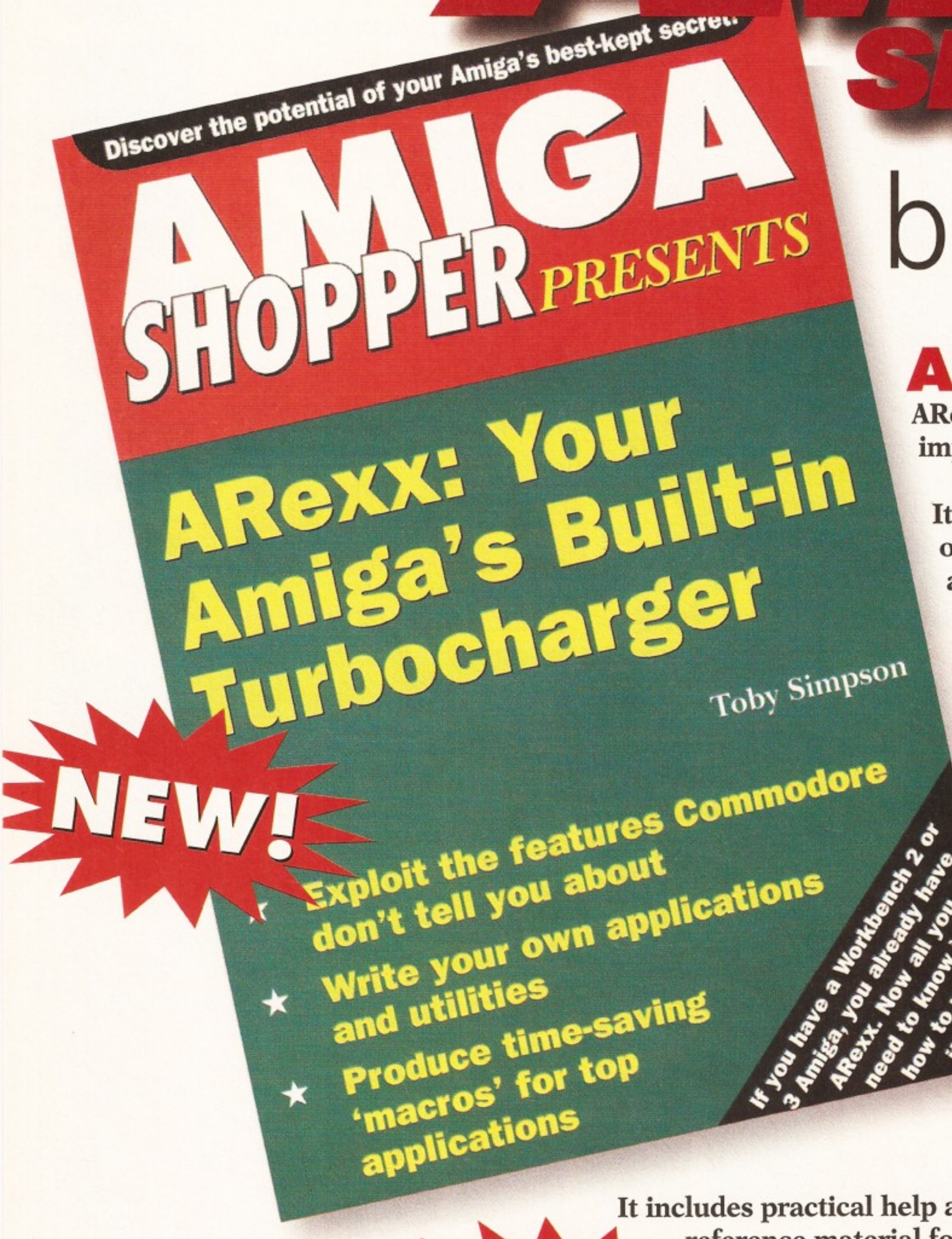
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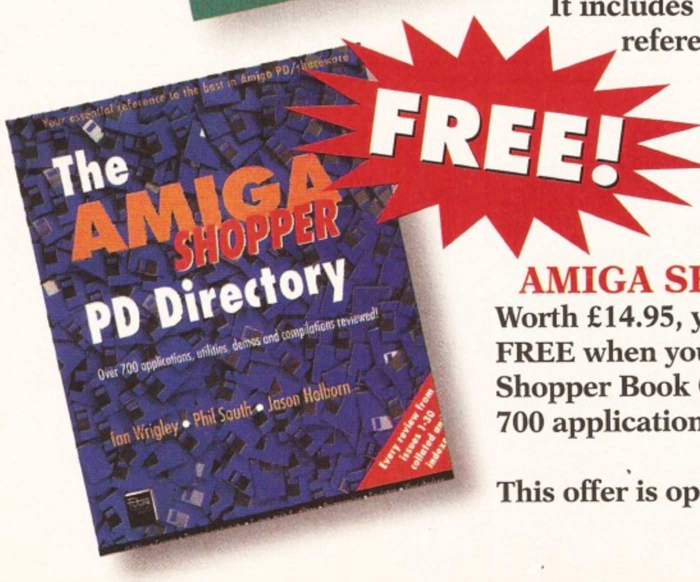
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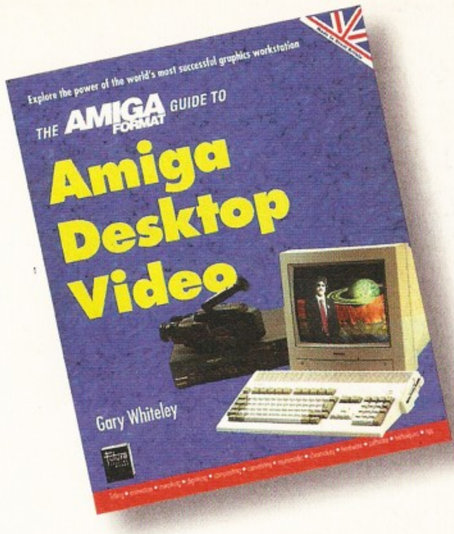
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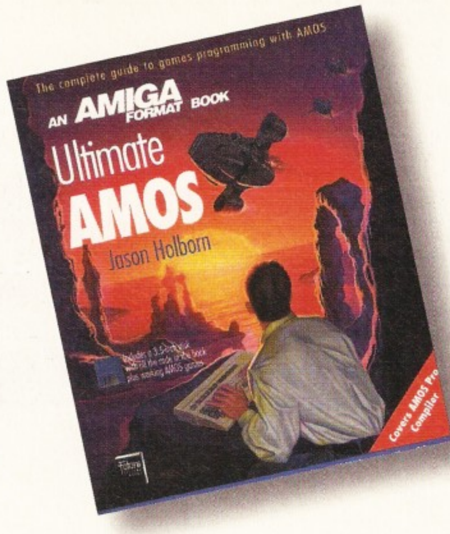
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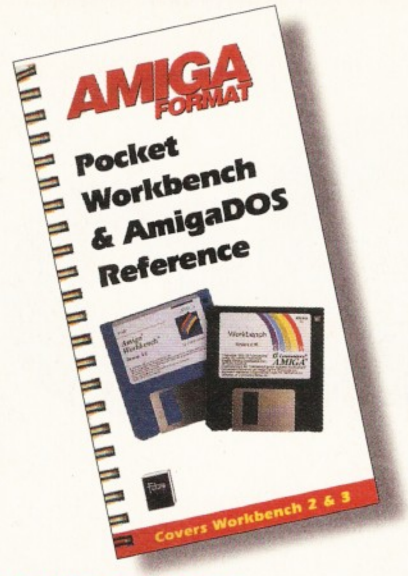
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Public Domain

Can't find the Public Domain program you need? ***Jason Holborn*** *trawls the ocean of PD software for Amiga Shopper's top 100 best titles.*

There's no escaping the fact that software is very expensive – with most packages costing anything from £40 to £400, building up a decent collection of software utilities and applications can cause a strain on even the most affluent pocket. That is, of course, unless you buy your software from a PD library.

As a regular reader of Amiga Shopper, you're probably already aware of what an amazing bargain PD software can be – how else, for example, can you legally obtain a fully featured word processor for the price of a disk? Just because it's free, doesn't necessary mean it's substandard either – some PD programs not only match, but better their commercial counterparts.

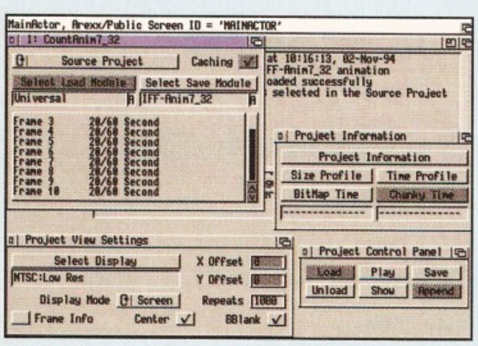
Over the next 10 pages you'll find what is possibly the most comprehensive list of PD software ever compiled. We've trawled through the PD libraries to find what Amiga Shopper believes to be the top 100 PD programs of all time. You can be sure that each and every program listed is the best in its class and is therefore well worth buying.

VMM

Cynostic PD disk U0294

No matter how much memory you plug into your Amiga, you can guarantee that it will never be enough. However, memory is expensive (typically £140 per 4Mb).

If you own an Amiga equipped with a memory management unit (MMU) and a hard drive, you can use VMM to fool your Amiga into thinking that it's equipped with up to 128Mb of memory using virtual memory. It may not quite be as fast as real memory, but is considerably cheaper.



MainActor enables you to create your own animations with relative ease.

Main Actor 1.54

PD Soft disk V1157

One of the most fascinating areas of computer graphics is animation. Main Actor is a powerful animation editing tool that – when used in conjunction with a paint program – can be used to pull together complex animations from single frames.

Main Actor provides full editing facilities and a powerful range of timing functions which let you fine tune the playback of your animation to 1/60th of a second.

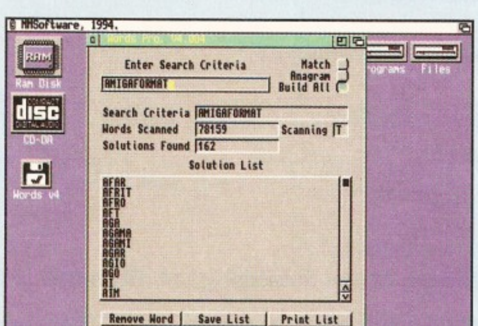
If you want to try your hand at animation without spending a fortune on a commercial animation package, give Main Actor a try.

WordsPro

Anglia PD

If you're a word puzzle nut then WordsPro will prove to be an invaluable addition to your software collection. Designed to handle anything from crosswords to anagrams, WordsPro is just the thing for solving those hard-to-crack word puzzles.

Using a word processor-like dictionary, WordsPro suggests a list of possible solutions to any word puzzle you care to ask it to decipher. WordsPro can learn new words too by feeding it ASCII text files, which it examines and then stores any new words.



Having problems solving that last crossword puzzle clue? You definitely need WordsPro.

ReOrg

KEW-II HD Utils 1

All disks – hard and floppy alike – become fragmented (split) the more that you use them. After a while, you may find that the speed at which data is written to and read from such disks slows down greatly, because of this fragmentation.

You can solve this problem, however, by running the disk through a disk optimiser such as ReOrg from KEW-II. ReOrg works by restructing your hard disk so that files are not fragmented. Reorganising your hard drive not only makes it a lot neater, but also speeds it up considerably.

Dynamic Skies

Virus Free disk V1265

Would-be Patrick Moore's will love this impressive astronomy utility from Virus Free PD. Like its more expensive commercial cousin, VRL's Distant Suns, Dynamic Skies enables you to browse the night skies without having to stand out in the cold with a pair of binoculars. What's more, you can tell it to display any part of the night sky you choose at any time in history.

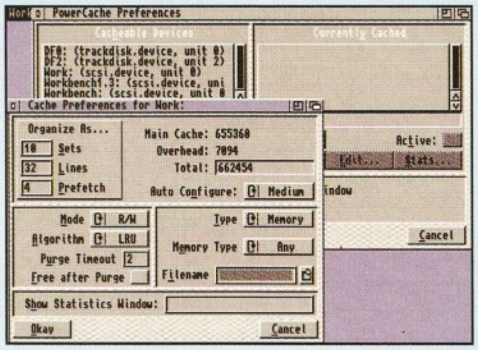
If your star and planet spotting skills are a little rusty, Dynamic Skies will even label the more interesting of the astral bodies for you, making this not only a very handy reference tool but an educational experience too. Highly recommended.

Epoch 6

Essex Computer Systems

If you're looking for the computer equivalent of a Filofax, then look no further than this powerful desktop address-book-come-of-all-trades from Essex Computer Systems. Epoch 6 is a 1299 year calendar/diary/scheduler which enables you keep track of all those important addresses, telephone numbers, appointments and anniversaries with ease.

What's more, you can alsocross reference much of the information. Say, for example, you had a lunch appointment with a friend. With Epoch 6, you could cross reference that appointment with your friend's address, so you could easily contact them to confirm etc.



Why not speed up your floppy disks with Cynostic's PowerCache?

ToolsDaemon

KEW-II HD Utils 1

ToolsDaemon is the sort of PD program that makes you wonder why Commodore never built such a facility into the Amiga's own operating system.

In simple terms, what ToolsDaemon does is to allow you to launch programs by selecting their name from the Workbench Tools pull-down menu.

And to help you define your own menu items, ToolsDaemon includes a powerful menu editor which is used to add and delete menu items.

PowerCache

Cynostic PD disk U0196

Amiga disk drives are well known for their less than impressive performance, but with PowerCache installed, you can give your disk drives a much needed boost.

As its name suggests, PowerCache is a disk caching (pronounced cashing) program that assigns a memory buffer to each drive to prevent unnecessary disk accesses.

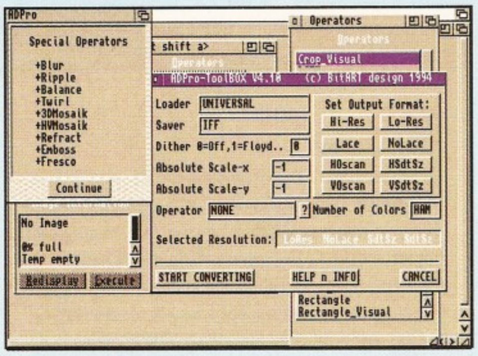
This memory buffer also holds any data which is read from disk so that if that same data is read again, your Amiga reads it from memory rather than having to access the disk again. The net result is a considerable increase in the performance of your disk drives. So give it a whirl.

ADPro Toolbox

Rob's Hot Stash #11

ASDG's Art Department Professional is a powerful program, but to convert or process an animation or batch of pictures requires a fairly comprehensive knowledge of ARexx or – if you can handle the cost – a commercial package such as Multiframe.

17 Bit Software's ADPro Toolbox could be the answer to your needs, however, as it can do the same job as Multiframe (i.e. process a



Batch processing with ADPro is a doddle when you've got ADPro Toolbox.

batch of images automatically), but it can be yours for the price of a disk. Although not quite as comprehensive as Multiframe, all the more common tools are there in abundance.

Filer

Cynostic PD disk U033

Most of us get to grips with the Amiga's Workbench in only a few hours, but the AmigaDOS Shell is a completely different story. If you still haven't quite got the hang of all those complicated DOS commands, then Filer could prove very useful.

ShopperPD Comms

Term 4.1

Cynostic PD disk U0278A

Rarely does a PD program rival its commercial counterparts, let alone leave it for dead, but that's exactly what Term 4.1 does – it's the most powerful comms package available for the Amiga. Better still, it can be yours for the price of a disk.

Running on all Workbench 2.0-based Amigas, Term 4.1 lets you communicate with bulletin boards and online services when used in conjunction with a modem. Like all good comms packages, Term can be customised extensively and it supports all the major terminal and file transfer standards including ANSI, Zmodem transfer and so on. A must for all comms fans.

AmigaFax

Cynostic PD disk U0182

With fax modems becoming more affordable, the demand for fax software has increased considerably. Problem is, only two commercial fax programs are available for the Amiga – GPFax and TrapFax – and both of these are £50+. If your budget doesn't stretch to this, why not save some serious dosh by treating yourself to a copy of this disk from Cynostic PD.

AmigaFax is a PD fax solution that lets you send and receive faxes on your Amiga using a clever fax printer driver which can fool any program that supports Preference printers into generating a fax which can be transmitted down the phone lines. Although it's not as friendly as TrapFax, AmigaFax is just as powerful.

ShowSTD

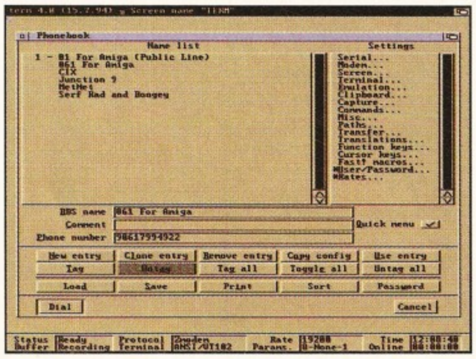
Roberta Smith DTP

Have you ever wondered where in the country a particular phone STD code is located? If so, then ShowSTD is for you. This no-thrills utility displays a window on the Workbench containing a map of the British Isles with a small string gadget immediately above it. Simply enter the STD code you're interested in and ShowSTD not only draws a little cross on the map indicating the area that the code covers but also displays its name. Worth noting, however, is that ShowSTD code hasn't yet been updated to cover BT's new phone codes, so bear this in mind.

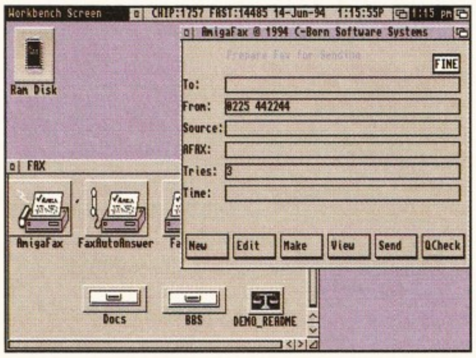
MAXsBBS

Cynostic PD U2089

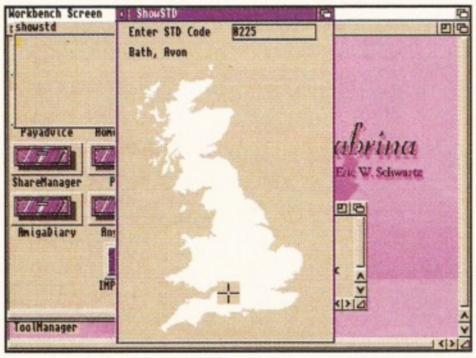
Fancy your own bulletin board system? Although only a demo, Cynostic's MAXsBBS is worth investigating if you want to get a taste of what it's like to run your own BBS. And it's very simple to get running – simply set a couple of assignments and you're away! Features wise, MAXsBBS is fairly powerful. Among the comprehensive list is full support for Fidonet mail, configurable message and file areas, conferences and so on.



Get on-line for the price of a disk. Term is the best comms program available.



Send and receive faxes on your Amiga with a fax modem and a copy of AmigaFax.

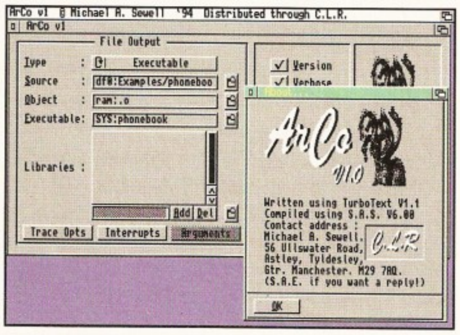


Track down the location of any telephone code in the country with ShowSTD.

ShopperPD | Programming

DICE
Fred Fish 491

On coverdisk 1 this month is DICE, which is a shareware C compiler that includes everything that you need to write, compile, link, debug and run your own C programs. This impressive package features full ANSI compatibility and all the support libraries necessary to code native Amiga applications. However, DICE does not include the official Include files, so these have to be bought directly from Commodore. Once you've obtained these, however, you'll have the most cost-effective C development system available for the Amiga.



ArCo lets you compile ARexx scripts into standalone executables.

Amiga E
Fred Fish 848

Looking for a challenging programming language? Look no further.

E is a powerful and flexible procedural programming language (complete with compiler) with features such as a compilation speed of 20,000 lines per minute on a 7Mhz Amiga, an on-line Assembler and linker integrated into compiler, a large set of integrated functions, module concept with 2.04 includes as modules, flexible type-system, quoted expressions, immediate and typed lists, low level polymorphism, exception handling and a great deal more.

Arco
Essex Computer Systems

The ARexx programming language bundled with all Amigas since the A500 + is fine for simple script programming, but its interpreted nature does restrict its usefulness.

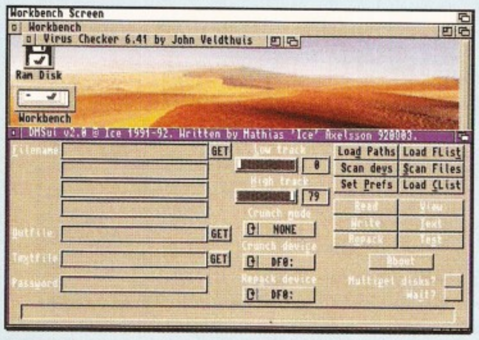
With Arco, however, you can convert your ARexx scripts into standalone executables which not only run faster than interpreted ARexx code, but you also get the added benefit that no one can take a sneaky peak at how your scripts work. Arco can also convert your ARexx routines into link libraries which can be called from other ARexx scripts.

93 Based around the successful Directory Opus utility, Filer lets you perform all those AmigaDOS functions simply by pointing and clicking on buttons. You can copy and delete files, create new directories, format disks and so much more without a single DOS command in sight. Isn't it time Filer was installed on your Workbench?

DMS Kit
Saddle Tramps PD

There are many different utilities designed for compressing files, but one utility has established itself as the standard for compressing an entire disk – DMS (short for Disk Masher). The problem is DMS is very complicated to use, so this disk from Saddle Tramps is a godsend.

Not only does it contain DMS, but also a number of additional utilities that make DMS that bit easier to use including DMSui,



DMS Kit brings a well needed Intuition front end to the DMS disk utility.

the latest Intuition front end for DMS.

If you want to compress entire disks rather than files, get DMS Kit.

Filthy Lucre
Saddle Tramps PD

Written by the author of Epoch 6, the best PD calendar/address book/diary utility around, Filthy Lucre is a home finance program that helps you to keep track of your money. The program's interface is reminiscent of Epoch's with several buttons running down the left-hand side of the screen.

Operating on a single double entry system, you simply enter a date for the transaction, a code (so that you can group transactions) and finally enter a value in either the debit or credit box. Filthy Lucre simply tots up your transactions so that you can see at a glance how much money is left.

Blackboard 3
F1 Licenseware

You don't need to spend hundreds of pounds on an expensive commercial image processing program – just get your hands on a PD image processing package such as Blackboard. This three disk licenseware program uses a modular design similar to ADPro with the functions loaded from disk as they are needed.

Feature-wise, Blackboard has an impressive list of operators which can be applied to your images, including morphing, warping, pixellation, embossing and bulging. This latest release also includes a very powerful Vista-like landscape generator. Blackboard 3 is an awesome PD program.

ImageStudio
17 Bit Software

Pitched directly at Blackboard 3, this upstart boasts a better looking front end that is modelled heavily on ADPro 2.5's fancy Intuition front end. Consisting of a main preview window (aka ADPro) and several smaller windows which hold such things as convolutions, effects and controls for adjusting your image's brightness and balance.

The unregistered shareware version can only handle images up to 250x250 pixels so you'll have to pay the £10 registration fee if you want to use ImageStudio for more serious work. ImageStudio isn't quite as powerful as Blackboard but it certainly bodes well for the future – let's hope that there's an upgrade real soon!

TextEngine 4.1
Cynostic PD

Need a word processor for your Amiga? Can't quite stretch to the cost of a commercial one? You need TextEngine 4.1! Whether it's a simple letter to your bank manager or a novel, TextEngine can handle it.

Boasting a front end that is pleasantly simple, TextEngine is a no-nonsense word processor that features all the usual array of document editing tools such as search and replace; block cut and paste; full printing support; and a 36,000 word dictionary.

Although it doesn't support fancy outline fonts and picture importation, TextEngine provides some powerful text editing tools.

Tutankhamun
Essex Computer Systems

The PD libraries contain a wealth of educational material including this two-disk set. As its name suggests, Tutankhamun is a multimedia educational title that covers ancient Egypt's most famous child king.

Produced using AMOS Professional, Tutankhamun uses a point and click front end that displays text, digitised pictures and diagrams. The title covers King Tut's short life and how his burial chamber was discovered and excavated. A well researched and beautifully put together package that is a must for all budding egyptologists. 97



Tutankhamun and his dog, pictured yesterday... Apparently.

Hottest 4

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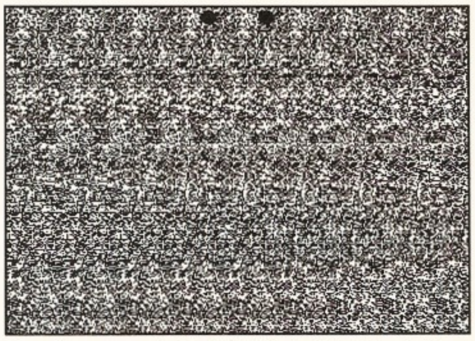
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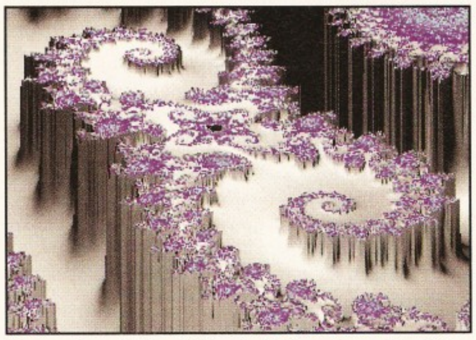
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ShopperPD — Fractals



Can you see what's hidden in this Magic Eye image? Nope? Nor can I!



It may be old, but Mandel Mountains is still one of the best fractal generators available.



Explore the Mandelbrot set in full 256 colours on an AGA Amiga with MandelMania.

SIRD Generator

KEW-II disk U1156

Unless you've spent the last few years in deepest, darkest Siberia, you cannot have helped but have noticed how incredibly popular SIRD (Magic Eye) images have become.

SIRD Generator is a utility that can be used to create your own SIRD images from any standard IFF picture. Written for all Workbench 3/0/AGA-based Amigas, SIRD Generator can produce SIRD images with up to 256 colours.

FracScape

17 Bit Software

FracScape is a PD fractal landscape generator written and compiled completely in AMOS that allows you to generate fractal landscape images at any angle using DEM files similar to those used by the commercial landscape generator, VistaPro.

VistaPro also inspired FraScape's user interface which, it has to be said, bears more than a striking resemblance to it. Rendering times are somewhat slow, however – an average scene takes around 45 minutes.

Mandel Mountains

Fred Fish 383

If there's one PD program that has encouraged me to buy PD more than any other, it's Mandel Mountains. Put simply, Mandel Mountains is a mandelbrot generator that renders mandelbrot images in three dimensions.

The resulting images look very much like snow-covered mountains and, although the program is looking a little long in the tooth these days, it's still one of the most fascinating fractal graphic generators ever developed.

MandelMania

Fred Fish 917

MandelMania is a fast Mandelbrot Set and Julia Set calculation program. The program can create animations automatically via ARexx script file and supports all Amiga graphic modes including AGA modes and autoscroll screens. It also fully supports loading and saving in standard IFF format and picture parameters are stored in a special chunk so that you can reload a fractal image and explore it further. Fractal types supported include the Mandelbrot/Julia sets and Lyapunov Space in two and three dimensions.

MovieGuide 2.04

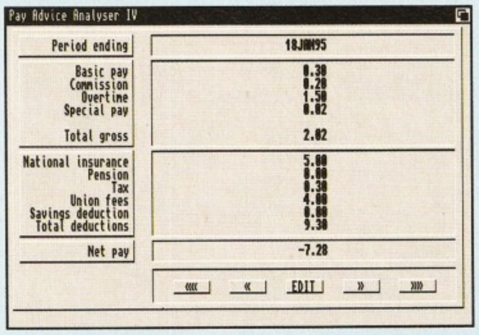
OnLine PD

If you're bit of a movie buff, then you will love MovieGuide from OnLine PD.

MovieGuide is essentially a database that covers all recently-released films (post 1970s). It contains information on a surprising number of films which can quickly and easily be interrogated using MovieGuide's powerful search functions.

You can search for a particular film by entering either the film's title, its director or even the name of one of its cast. When the film is found, MovieGuide displays all sorts of useful information, including a breakdown of the film's plot, a list of major actors, when it was released and so on.

What's more, you can even add your own records to keep MovieGuide up to date.



Is the Inland Revenue ripping you off? Make sure they don't with Pay Advice Analyser.

Pay Advice Analyser

Roberta Smith DTP

Pay Advice Analyser can help you to keep track of how much you should expect to be paid. The program takes into account how much your basic pay is, commission, overtime and any special pay. It then uses these figures to provide you with a breakdown of your gross pay, tax liability and so on until you end up with your take-home (net) pay.

A simple, but very effective utility that gets the job done with a minimal amount of fuss. If you want to keep a beady eye on the taxman and your employer, Pay Advice Analyser is ideal.

ABank

Immediate Arts PD

ABank is a charming little home accounts package from across the English channel. Programmed using AMOS, the program uses an Intuition-like front end that, whilst it looks like Intuition, is displayed at hardware level.

Like all good home accounts packages, ABank works a bit like a bank statement – each transaction is listed one after another in date order along with either a debit or a credit which is used to adjust a running balance.

The program also features a number of powerful graphing functions which can translate your account information into bar and pie charts.

VideoTracker AGA

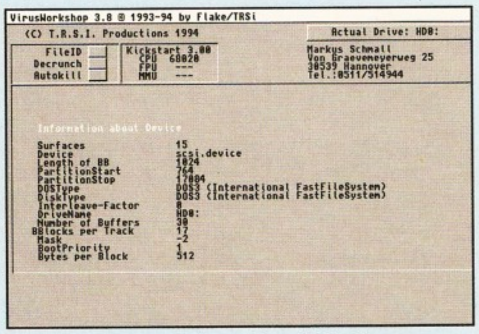
Club 1200

Utilities that can claim to take full advantage of the A1200's AGA chip set are few and far between but VideoTracker AGA is one such program. VideoTracker is essentially a PD version of Almathera's brilliant VideoCreator package which enables you to create your own demos (or videos, as the author prefers), consisting of music, sound samples, static images, animations and the wide range of weird effects provided by the program. A must for all demo fans.

Virus Workshop 3.8

Cynostic PD U0246

If you want to protect your disks from the many computer viruses that are still wreaking



Stop the dreaded lurgy from infecting your machine with Virus Workshop.

97 havoc, then you need a virus checker such as Virus Workshop from Cynostic PD.

Virus Workshop is a virus killer with some impressive credentials. It can check for Trojan Horse viruses, bootblock viruses, check memory and even check crunched files for parasite viruses.

What is impressive about Virus Workshop, however, is the vast number of viruses it can recognise – literally hundreds. Protect and survive – get a copy of Virus Workshop.

Garshneblanker

Roberta Smith DTP UT019

Garshneblanker is a modular screen blanker, complete with a collection of 14 screen savers which you can choose between.

Like the classic AfterDark utility on the PC and Mac, these screen blankers offer a variety of fun blanking patterns and effects ranging from flying toasters and swirling lines to starfields and scrolling text.

SuperDark 2.1A

KEW-II PD

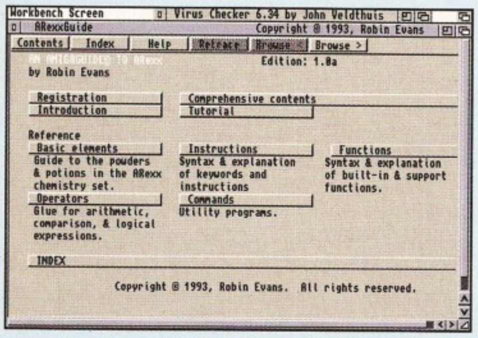
If you want something a little more specified than Garshneblanker, then try SuperDark 2.1A. Written for Workbench 2.0 or better, SuperDark features a truly bewildering number of balking effects which cover all the classics – flying toasters, psychedelic lines and so on – plus a few extras, such as a flying 3D Commodore logo and a unique slideshow module which can flick through a selection of images. Some of the modules are rather processor intensive, so you need a fairly porky Amiga for the more exotic effects. An impressive and well designed utility.

ABackup 2.1

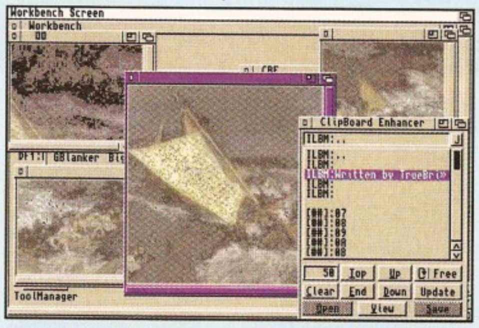
KEW-II HD Utils 1

Hard disks are wonderful things, but they do occasionally go wrong resulting in the loss of your valuable data. To make such a disaster less of a heartache, ABackup enables you to back up the contents of your drive to a set of floppy disks.

Like all good backup utilities, ABackup lets you select exactly what is backed up which helps keep the number of backup disks needed down to a bare minimum. The latest release (version 2.1) boasts a full Workbench 2.0 front end and some impressive compression routines. A must for all hard disk owners.



If you haven't got Workbench 3.1, you can view AmigaGuide files with ARexx Guide.



Clipboard Enhancer does precisely what its name suggests – it enhances the clipboard.

DiskSalv 2

KEW-II HD Utils 1

What do you do if a disk containing valuable data should become corrupt? Well, you could use DiskSalv. DiskSalv is a powerful disk recovery utility that attempts to restructure a corrupted disk so that (in theory, at least) you can rescue any data that would otherwise have been lost.

Designed to be used with both floppy and hard disks, DiskSalv is surprisingly successful – even disks that are seemingly totally beyond hope can be rescued. If you value your data, then this is one PD utility that should be in your disk box.

ARexx Guide

PDSoft V1219

Commodore don't actually include an ARexx manual with any Amigas other than the A4000, so getting to grips with the ARexx language instruction set is a little difficult. To make the learning process that bit simpler, however, PDSoft can sell you a copy of ARexx Guide, a complete reference and instruction guide to this powerful language.

Running under AmigaGuide, ARexx Guide uses AmigaGuide's powerful Hypertext links to make the task of finding the information you want a lot easier.

Clipboard Enhancer

Roberta Smith DTP UT019

As its name suggests, Clipboard Enhancer is a utility that er... enhances your computer's clipboard. With Clipboard Enhancer installed, you can make your Amiga use as many clipboard 'blocks' as you wish, limited only by the amount of available memory.

Of course it can be a real pain having to switch from one screen to another every time you wish to change the current clip, Clipboard Enhancer overcomes this by featuring a special jump mode which displays a window listing all the available clips.

All you then need to do is click on the clip you're interested in and Clipboard Enhancer passes it to the appropriate application.

Iconian

Fred Fish 991

AGA-based Amigas may be able to display a 256-colour Workbench screen, but how do you create 256-colour icons?

Iconian is a powerful Workbench icon editor written specifically for AGA-based Amigas that can be used to create icons with up to 256 colours and of any size.

Based around a friendly Workbench 3.0 front end, Iconian features all the usual DPaint-like drawing tools, plus a useful bevel tool which produces Workbench 2.0-like bevelled boxes.

ViewTek 2.1

KEW-II V1145

One of the most useful PD utilities you could ever lay your hands on has to be ViewTek from KEW-II PD. ViewTek is a Workbench 2.0-based utility which can be used to view animations and pictures and even convert images from GIF or JPEG format to IFF (so you can load them into DPaint).

Written by the author of GVP's ImageFX (a commercial image processing program), ViewTek is extremely simple to use too – just double-click on its icon, select the file you wish to view and ViewTek does the rest. All in all, ViewTek is a fantastic utility.

Find It

Licenseware disk CLU037

The larger a hard disk is, the easier it is to lose your files. Unlike most other computers, however, the Amiga doesn't offer any form of find file facility, so the PD libraries have stepped in to fill the gap with Find It.

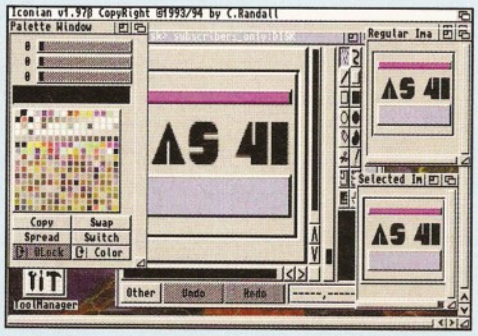
Not only will Find It locate a chosen file on any device, but it can also read, animate, display or execute them. You don't even need to know the full name of the file – simply pass it a search pattern using wildcards and Find It will find any files that fulfil the search criteria.

AssignManager

PD Soft V1228

Keeping track of logical assignments can be made that bit easier with a copy of AssignManager installed on your system.

Designed as a preferences editor which can be slotted into the same drawer as the system pref editors, AssignManager provides a quick and easy method of keeping track of assignments required by the systems software and any programs installed on your system. Assignments can be added, edited and deleted simply by clicking on gadgets. 100



Iconian is the first true AGA-compatible icon editor. Now you can create 256-colour icons.

98
DiskCat 2.1

Scribble PD U299A

DiskCat is a powerful disk cataloguer which can be used to maintain a database of the disks in your collection. DiskCat works by reading the directory structure of each disk in turn, so that it knows exactly what files are on which disks.

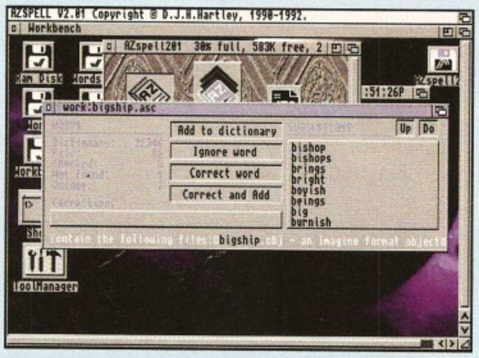
You can also add comments to individual files and then use DiskCat's comprehensive search facilities to find the file you want.

DiskMate 4.0

Scribble PD U299A

Do you find AmigaDOS heavy going? Then DiskMate is just what you've been looking for.

Among its many functions, DiskMate can be used to check floppy disks and install disks, it can also be used for multidrive erasing and formatting, multidrive copying of DOS and non-DOS disks and you can even crunch entire disks in DMS format. Similar in many ways to Directory Opus, DiskMate is a real time saver.



Can't spell for toffee? You most probably need a copy of AZSpell mate.

AZSpell

17 Bit Software 2886

AZSpell has long been a popular PD spell checker – its reputation is well deserved. Complete with a dictionary containing 22,346 entries, AZSpell can be used to spell check any ASCII text file.

Bundled with the program is an additional utility called AZMerge which will scan through a (already spell checked) document and add each and every new word that it finds in the document to the program's dictionary.

Most word processors feature spell checkers these days, but if yours doesn't, then look no further than the wonderful PD program AZSpell.

Word Finder Pro

Virus Free PD

If you're still having difficulty solving your favourite crossword puzzles or anagrams, then you should definitely consider giving Word Finder Pro a go.

Simply feed it the letters that you already know of the word that you want to find – W*SH, for example – and Word Finder Pro searches through its extensive dictionary and lists any words that match the search criteria – such as WISH, WASH.

Boasting a 58,000 word spell checker, Word Finder Pro can handle even the most devious crossword puzzle or anagram.

Shopper**PD** Music

EaglePlayer

Roberta Smith DTP MUS091AB

If you enjoy tinkering with Sound Tracker clones such as RBF's OctaMED, then EaglePlayer should prove to be an indispensible addition to your music setup. EaglePlayer is a fully featured module player that can load and play most of the more common Sound Tracker module formats.

What makes it so very special, however, is its impressive array of quadrascopes, spectrum analysers, level meters and so on which operate in time to the music.

DX100/TX81Z Editors

Fred Fish 598

Casio CZ synth owners aren't the only ones who can save serious bucks by buying their patch editors from the PD libraries – Fish disk 598 is home to two patch editors designed for Yamaha's DX100 and TX81Z synthesisers.

Like all good patch editors, both these programs enable you to you edit and audition voices before transferring the whole voice bank back to your synthesiser. Apart from a couple of minor gripes, both editors rival their commercial cousins with ease.

Sonic Drum Kit

17 Bit Software

Percussion fans will love 17 Bit's Sonic Drum Kit, a program that transforms your Amiga into a powerful drum machine. Sonic Drum Kit is designed specifically as a tool for creating drum tracks. Each bar is displayed as a grid running along the top of the screen with each of the Amiga's four sound channels able to play one drum sound at any one time. A range of common drum sounds are provided including bass drums, snares, hi-hats, toms and so on. A fun program that even non-musicians will enjoy tinkering with.

CZED

Fred Fish 223

Synthesiser patch editors tend be some of the most expensive music-related programs you can buy, with most costing at least £100. If you're lucky enough to own a Casio CZ-series synth, however, you can get your hands on one for just £2! CZEd is a complete patch editor/voice librarian for the CZ-series of synths that will let you edit existing patches and even create new ones from scratch. CZED can also be used as a librarian for your sound banks.

FMSynth

Fred Fish 956

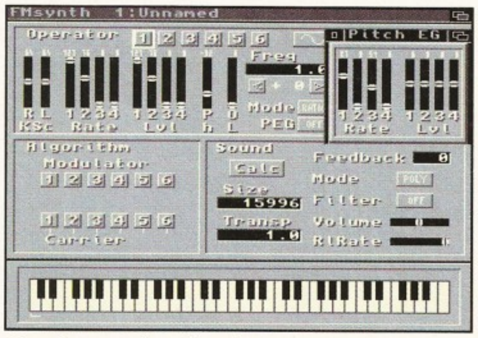
FM synthesis has been used extensively on professional synthesiser keyboards, such as Yamaha's DX7, and now it comes to the Amiga thanks to FMSynth.

FMSynth can create sounds using FM synthesis. Like a real synthesiser, it has six operators, a realtime LFO and a free editable algorithm. The sound can be played on the Amiga keyboard or on a MIDI keyboard which is connected to the Amiga. The sounds can be saved in IFF-8SVX (one or five octave) or raw format.

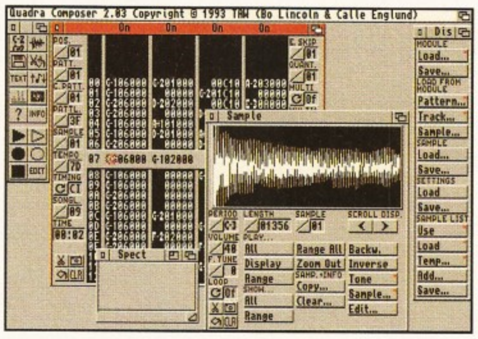
QuadraComposer

Fred Fish 999

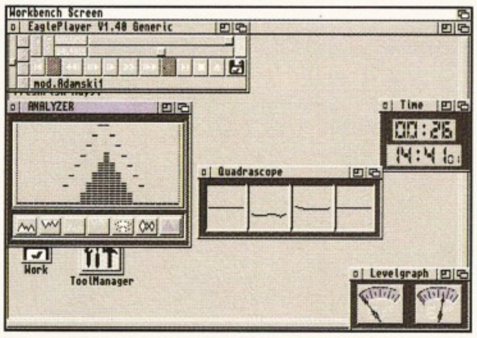
If you want to try your hand at writing music, then QuadraComposer on Fish disk 999 could prove useful. QuadraComposer is a music tracker which uses the internal Amiga sound capabilities. Features include a standard intuition front end, support for Protracker and Extended Module (EMOD) formats, built-in synthesiser in the sample editor. Also included is QuadraPlayer, a relatively small module player that handles both Protracker modules and Extended Module.



Create sounds using the same synthesis technique as a Yamaha DX with FMSynth.



QuadraComposer provides all the tools necessary to create music on your Amiga.



EaglePlayer can play a vast number of different module formats.

ButtonMenu

Cynostic PD U0279

There are plenty of launch pad-style utilities available for the Amiga – programs which allow you to run your most commonly used applications by simply selecting them from some form of menu – but few are as flexible as ButtonMenu.

ButtonMenu lets you define a window on the Workbench containing a specified number of buttons, each of which can be assigned a program. When you click on a particular button, ButtonMenu then loads that program into memory.

ShowFont

Cynostic PD U0291

ShowFont is a handy utility that lets you keep track of the fonts installed on your system. It handles standard bitmapped and CompuGraphic outline fonts and it even shows colour fonts in their default colours.

Its only real fault is the slow screen update and somewhat irresponsible user interface – if you can put up with having to occasionally wait, ShowFont is well worth investigating.

Flexer

Roberta Smith DTP

If you're looking for a PD database program that is suitable for simple card file style applications, then check out Flexer from Roberta Smith DTP.

Boasting a nicely designed front end, similar to Harwood's FinalData, Flexer is ideal for keeping lists of data such as names and addresses, or even the membership details of your local tiddly-winks club. Flexer's greatest asset is its ease of use – without even reading the documentation you should get to grips with Flexer in minutes.

KingFisher 2.0

Fred Fish 1000

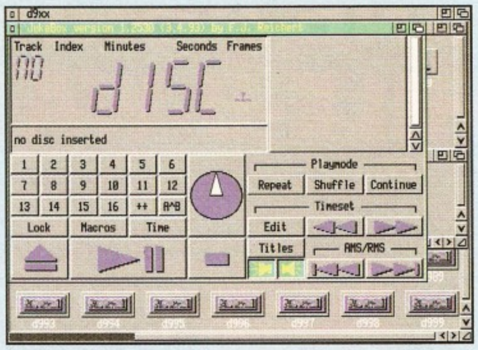
Locating the PD program that you want in the Fred Fish library is almost impossible unless you've got a copy of this brilliant utility on Fish disk 1,000. KingFisher is a sort of glorified database that contains information on every single program in the Fish collection.

Simply tell KingFisher the type of utility you're interested in (or even its name) and it then searches through all 1,000 disks for a program that suits your needs. You can then order that disk safe in the knowledge that it will contain the program that you want. A must for all serious PD fans.

LoanCalc

Fred Fish 987

If you've taken out a mortgage or a loan, then you'll find this mortgage/loan calculation utility a real godsend. Although similar programs exist, this one is unique in that it is designed to track 'open' mortgages that allow any size of payment to be made at any time, as well as providing a printed



JukeBox transforms any SCSI CD-ROM drive into an audio CD player.

amortisation table for fixed mortgages with monthly, semi-monthly, bi-weekly and weekly payment re-schedules.

Digital Breadboard

Fred Fish 999

Digital Breadboard is a full GUI digital circuit simulator. It currently supports: 2 and 3 input AND, OR, NAND and NOR gates, NOT and XOR gates, D, JK, and SR edge-triggered flip-flops, multiple independent clocks, switched and pulsed inputs, outputs, Vcc, GND, independent 4-channel trace scope, event counters, variable speed timer, preferences printing and more.

Digital Breadboard also includes combinational logic design utilities. Phew!

BBase III

Fred Fish 998

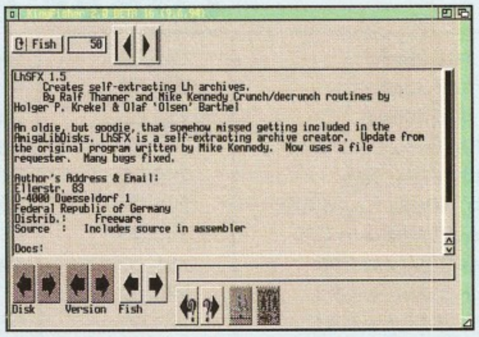
BBase III is an easy-to-use, yet full-featured, database program that runs on any Amiga with WB1.3 or better.

It offers search or sort on any field, print mailing labels, delete or undelete records, mail merge, get reports in many formats, scramble files, flag records and more. Fields are user-configurable so BBase can be used to keep track of addresses, tape or video collections, recipe files or indeed anything else you can think of!

MegaEd

Fred Fish 743

If Commodore's own Memacs text editor doesn't quite get the creative coding juices flowing, then the PD libraries have the answer in the shape of MegaEd.



Locate any program in the Fred Fish library with KingFisher 2.0.

MegaEd is a powerful text editor which performs as well as it looks. It's one of the most fully-featured text editors I've ever seen, rivalling commercial competitors such as CygnusEd with ease. As well as a full array of text editing functions, MegaEd also boasts its own macro programming language and database functions.

MultiTool II

Fred Fish 997

MultiTool II is a directory utility similar to Directory Opus. It offers all the basic functions (such as copy and delete) and special features which can be added using external programs. LH-Archives can be double-clicked, like directories, causing MTool to display the archive contents in the directory list. You can copy files into the archive (add), out of the archive (extract), or delete them just like a drawer.

Magnetic Pages

PD Soft V688

Disk magazines used to be all the rage a few years back and, with the help of Magnetic Pages, you too can get in on the action.

Magnetic Pages is a set of three programs which let you create and display your own disk magazines. Text and graphics can be combined on a page and you can even set up icons which allow the user to branch to other parts of the magazine. Sound and music is supported too, allowing you to create disk magazines that are virtually a multimedia experience.

JukeBox

Fred Fish 994

Got a CD-ROM drive? Want to hear some music while you work? You need JukeBox, a program to play compact digital audio discs by emulating a Graphical User Interface similar to common CD players. It supports various SCSI CD-ROM drives, the CDTV and A570, and provides a command line and fully programmable ARexx user interface as well.

VirusZ II

Fred Fish 989

Release II of this popular virus detector that now recognises 279 boot and 145 file viruses. The filechecker can also decrunch files for testing. The memory checker removes all known viruses from memory without crashing the machine and checks memory for viruses regularly. VirusZ has an easy-to-use intuition front end including keycuts for both beginners and experienced users. VirusZ requires Workbench 2.0 or better.

Imploder 4.0

Fred Fish 984

If you can't quite stretch to the cost of PowerPacker, then look no further than Imploder 4.0. Imploder 4.0 allows you to reduce the size of executable files whilst retaining their full functionality.

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1 MEG FATTER AGNUS	£34·95	Mouse Mat	£3·95
2 MEG FATTER AGNUS	£39·95	Dust Cover	£3·95
PAULA	£19·95	10 Unbranded Disks	£4·95
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30 Pin 8 Bit 80ns	32	-	122	-	-	-
32 bit GVP SIMMs	65	-	188	-	925	-

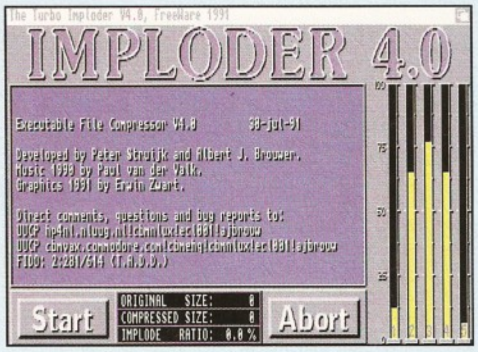
IDE Hard Drives (SCSI & SCSI II also available POA)

Various Quality Makes 3.5" Low Profile		Western Digital Caviar 3.5" Low Profile (V. Fast)		Various Makes 2.5" (A1200 or CD32 SX 1)	
SIZE	PRICE	SIZE	PRICE	SIZE	PRICE
170	135	341	220	80	130
210	149	425	235	130	170
250	159	540	270	250	225
320	169	730	345	340	295
420	189	1080	489	405	360
540	219	**** New Lower Prices ****		520	480
1080	485				

Note: 2.5" drives come with fitting kit for A1200 and CD32 SX-1 module
3.5" drives can be fitted into A1200. Fitting kit costs £20 when bought with drive.

Other Items

Viper 030 MkII 28mhz	140.00	Toshiba XM3401B CD Rom	275.00
Viper 030 MkII 33mhz	207.00	Media Vision SCSI Rom	150.00
Viper 030 MkII 40mhz	235.00	Zappo A1200 CD Rom	185.00
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WarpEngine 28Mhz w CPU	785.00	SVGA 15" FST m/sync Monitor	310.00
WarpEngine 33Mhz w CPU	980.00	CD32 SX1 Module	189.00
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50mhz FPU 68882	120.00	Video Backup V3.0	55.00



Imploder will even play a tune whilst it crunches program files.

There are lots of other Amiga crunchers or packers available, but none are as mindful of the complexities of your Amiga system as Imploder. Also its algorithms are more efficient in terms of speed and size reduction.

SysInfo 3.24

Fred Fish 969

If you like to know just how fast your Amiga can crunch through numbers, then check out SysInfo. What it does is to analyse your system and report all sorts of useful information which may be useful when fixing compatibility problems and so on.

SysInfo tells you library revisions, the hardware specification (what graphics chips you have and so on) of your system and can even tell you how fast your system is running.

SuperDuper 3.1

Fred Fish 979

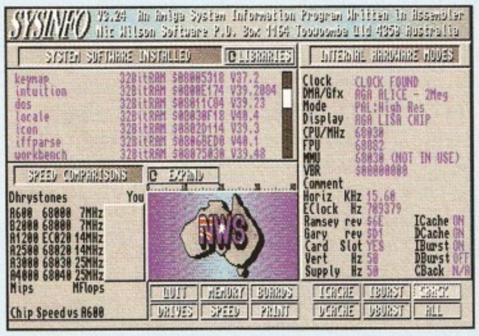
SuperDuper is a high-speed disk copier and formatter. Typical timings are 99s for a disk-to-disk verified copy, or 38s for a four disk non-verified format. Also available are buffering in RAM on a hard disk image file, or on any sector-based Amiga device.

Real-time compression using the Xpk standard allows you to copy most disks on 1Mb Amigas. It also includes high density floppy support, voice, automatic date increment, a list of the disks copied and automatic start of operations based on disk insertion/ejection sensing.

WordFinder Plus

Virus Free PD

WordFinder Plus is a licenseware program



If you need to know the specification of your machine, then SysInfo is the tool for you.

which is designed to help you solve crossword puzzles and anagrams. It comes complete with its own 40,000+ word dictionary which can be taught new words with ease.

Using an attractive and clear front end, WordFinder is stupidly easy to use – just feed it either an anagram, or the letters you know from the word that's giving you trouble in a crossword, and WordFinder Plus comes up with a list of words that fit the bill.

A must for all puzzle fans.

EasyCalc

Roberta Smith DTP BU108

By far the best PD spreadsheet program available has to be EasyCalc from Roberta Smith DTP. Although it does have its share of limitations, it'll handle even the most demanding spreadsheet applications.

Like a professional spreadsheet EasyCalc is programmable – that is, you can set up the spreadsheet using a series of formulae so that it produces the results you want.

Astro 22

PD Soft V685

Astro 22 is a professional astrology program which is supplied on a self-booting diskette. When it's first loaded, the program displays an astrological chart (complete with weird star chart runes) along with masses of summary information, cusps and so on.

Creating a new chart is child's play and once it's been redrawn, you can quickly and easily dump the chart to paper. You still need to be able to interpret the chart, however...

MiniMorph

Fred Fish 921

If you've watched movies such as Terminator 2 and Star Trek VI, then you will already have seen fine examples of morphing in action. There are plenty of commercial morphing packages available, but you can dip your toes in the fascinating world of morphing free of charge with a copy of MiniMorph.

Written completely in Assembler and based on VMorph by Lee Wilkie, MiniMorph is nearly 50 times faster than any other PD morphing program. The only drawback is that the program is currently limited to 16-colour greyscale images.

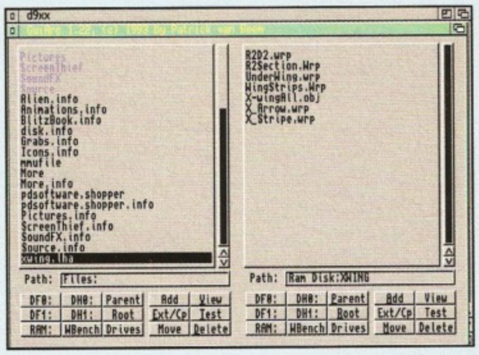
GuiArc

Fred Fish 933

If you're a comms fan, then you'll already have discovered that most files that you download from a BBS need to be dearchived before they can be used.

GuiArc provides a Graphical User Interface for cli-based archivers such as lha, arc, ape and zoo. It has the look and feel of a directory tool and can perform all basic actions on archives, such as add, extract, list, test and delete.

You can enter archives as if they were directories with no knowledge of CLI-based archiving utility.



GuiArc decompresses archive files without getting your hands dirty with the Shell.

KingCON

Fred Fish 977

A console-handler that optionally replaces the standard CON: and RAW: devices. It is 100 per cent compatible with Commodore's own, but adds some very useful features, such as filename completion (just press the TAB key), a review buffer, Intuition menus, jump scroll and cursor positioning using the mouse.

If you spend a lot of time using the Amiga's Shell environment, then this is one PD program that should be permanently installed on your system.

YAK

Fred Fish 971

Short for Yet Another Kommodity, YAK is one of the best general purpose commodities you can install on your system.

The program features a Sunmouse that not only activates the window immediately below the mouse pointer when the mouse stops, but also key activation of windows, the ability to click windows to front or back, cycle screens with mouse, mouse and screen blanking, key click, close/zip/shrink/enlarge windows with programmable hotkeys and a lot of other configurable hotkeys.

A must for all Workbench fans.

AmigaWorld

Fred Fish 893

AmigaWorld is a database program that contains information about every country on Earth. It enables you to have a look at the data of one country or to compare information.

Among other things, it displays location, capital, area, population, languages, currency and the flag of each country. AmigaWorld is very easy to use and you can use it with your favourite font, screen mode and colours. Ideal for geography students everywhere.

CPK

Fred Fish 809

Budding chemists will love CPK. Written by Eric Suchanek, CPK is a program which creates rendered illustrations of atoms and molecules in the same format as Corey, Pauling and Kendrew plastic models (chemists will know what these are!). Like the real thing, CPK can scale and rotate your molecules so you can view (and render) them from any angle.

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IconTrace
Fred Fish 968

Most programs allow you to configure how they work by altering their tooltypes. Unfortunately, not all programmers are kind enough to document each and every tooltype parameter that their program supports. This is where IconTrace comes in.

What it does is monitor any programs that you load and display any tooltypes that they attempt to read. Armed with this information, you can then use those tooltype parameters yourself. A simple, but indispensible, tool for all Workbench buffs.

BootJob
Fish Disk 814

BootJob is a small, but useful, Workbench utility that enables you to store, copy, install or view any disk's bootblock. This comes in particularly handy with game disks, as you can store their bootblocks safely on disk and restore them should the original disk become infected with a virus.

BootJob's most impressive feature is its 'Save as Executable' function which lets you literally boot a disk from the Shell in the same way as you would load a program.

Arq 1.7
Cynostic PD

Ever wanted to spruce up those boring requesters that appear on your Workbench screen every time your Amiga wants you to do something? With Arq 1.7, you can. Arq replaces the standard Amiga system requesters with some nice neat animated 3D requesters which pop up in the centre of the screen (rather than the top left-hand corner).

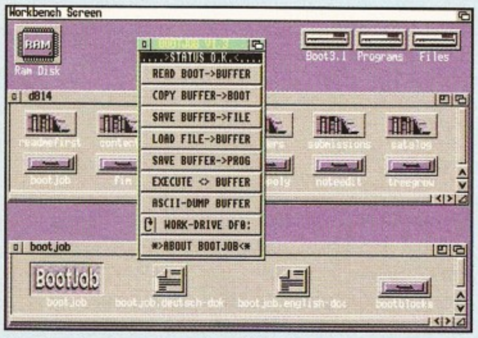
Each system event (even the dreaded software failure) has its own unique animation (if your machine crashes, for example, a little animated skull and crossbones is displayed).

Even if Arq doesn't actually make them any friendlier, it at least makes your system that bit more polished.

SID 2.0
Fred Fish 651

The best PD rival to the commercial package Directory Opus has to be Tim Martin's excellent SID 2.0, a program that still enjoys a considerable following in the Amiga community. Looking frighteningly similar to Opus, SID matches its commercial rival in virtually all departments.

Although it's not as configurable, SID's disk and file management tools (the heart of the program) are as good as any program in its class. If you can live without Opus' thrills, SID is no poor alternative.



Protect your game Bootblocks from viruses by storing them with BootJob.

LockIt
Fred Fish 798

If you are concerned that someone might look at your private files, LockIt may help. LockIt is a tiny Workbench 2.0 Commodity program that allows you to password protect files or drawers that you select.

As long as LockIt is running, it will be virtually impossible for anyone to gain access to those objects. Although it's not completely fail safe (particularly knowledgeable Amiga owners would probably be able to get around LockIt fairly easily), it does at least stop those who don't understand the Amiga's operating system that well.

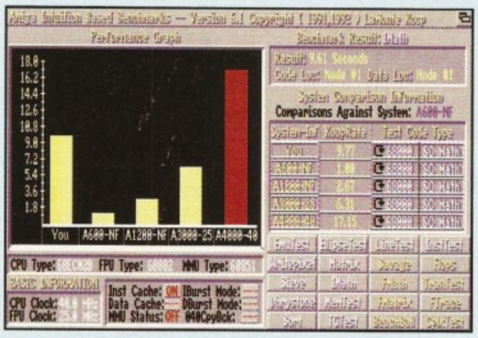
Scion
Cynostic PD

Scion is a genealogy database designed specifically for handling family trees. It is very simple to use because much of the work is concentrated around two windows – a personal details window (holds information on individuals, such as birth date, place and sex), and a family details window (information on marriages and offspring). What's more, you can also attach IFF images to each personal record so there's no reason why you can't incorporate a digitised family album too.

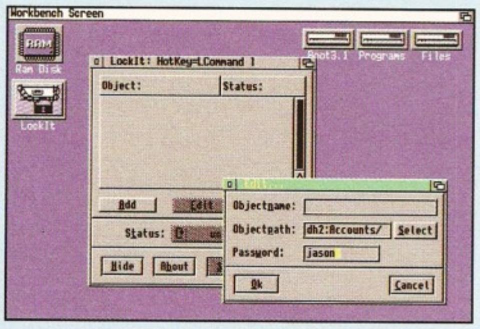
AIBB 6.1
PD Soft V948

If there's one utility that has established itself as the standard benchmark utility for testing the performance of Amigas, it has to be LaMonte Koop's AIBB.

Short for Amiga Intuition Based Benchmarks, AIBB not only provides extensive information on your system (such as type of processor, floating point units, memory, boards and graphics boards), but it can also be used to test the speed of your machine relative to a number of standard Amigas, including the A600, A1200 and A4000/040. A vast range of benchmark tests are included, such as integer math, sieve and dhrystone.



How fast is yours? Find out with AIBB, the best benchmark utility available.



Keep prying eyes away from sensitive files by locking them with LockIt.

DFA
Fred Fish 874

There are plenty of address book utilities available in the Amiga PD libraries, but few come close to the power of DFA on Fish disk 874. DFA is an address book utility that features E-mail support (up to three E-mail addresses can be attached to each record), dialling, different types of printing addresses, full Commodity support, an application icon, font sensitive windows and full hot key support.

If you want the best address book utility, look no further than this program.

ToolManager
Fred Fish 752

ToolManager is a full-featured program for either Workbench or CLI tool management. The program includes the ability to add menu items to the Workbench 2.0 Tools menu, add Workbench icons or dock Windows.

Also included is support for multi-column docks that automatically detect largest image size, ARexx, sound and Locale support.

HyperAnsi
Fred Fish 851

HyperAnsi is an ANSI editing program suitable for creating ANSI pages for a BBS system. It allows you to edit up to 999 pages at a time with a unique transparency mode which allows you to see through pages.

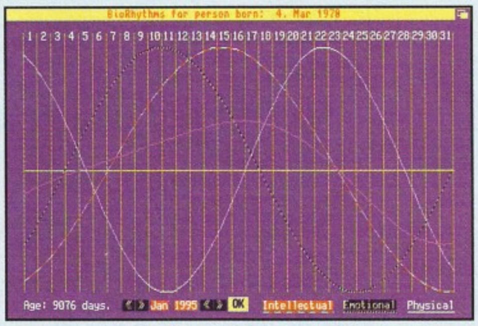
Other features include: copy, move, fill, replace, flood fill, text alignment and justification, line drawing, character painting (colours and/or text), half character painting and keyboard remapping for all 255 IBM characters, plus much more.

SIP
KEW=II U1123

Have you ever wondered what's going on under your Amiga's bonnet? With SIP you can examine your Amiga's most intimate depths without resorting to a screwdriver.

SIP, short for System Information Program, is a handy tool which provides a simple method of viewing the status of the many resources that keep your Amiga's heart beating – libraries, ports, hardware interrupts, tasks and so on. Don't worry – fiddling with SIP won't harm your Amiga in any way, so feel free to experiment.

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Avoid bad days at the office by planning ahead with Biorhythms.

Biorhythm

Fred Fish 862

If you believe in biorhythms, then you can use this handy utility to generate biorhythm charts on your Amiga. Biorhythm is an Intuition-based program that displays your three basic biorhythms plus the average rhythm.

ZShell

Cynostic PD

ZShell is a replacement for the Amiga's Shell that makes AmigaDOS that bit friendlier on a single drive machine. Running on all Amigas, ZShell has 63 built in commands that replace Commodore's own disk-based commands, so there's no disk swapping involved when any of these commands are called.

ZShell also offers extended wild card support (you can use the '*' symbol), filename completion (simply press the TAB key) and – best of all – it's just 26K, so ZShell should squeeze on to even the most crowded Workbench disk.

LastAlert 2.1

KEW=II U1123

LastAlert 2 is a utility that lets you know exactly what went wrong whenever your Amiga crashes, using something that is sadly lacking from most of the Amiga's operating system – plain English.

Copy the LastAlert 2 program into your WBStartUp drawer and then, whenever a crash occurs, a window will be displayed on the Workbench as soon as your Amiga reboots, containing all sorts of information – the GURU code, what program caused the crash and a short description of what actually happened.

PC-Task

Fred Fish 866

PC-Task is a software-based emulator that allows you to run PC software on your Amiga. Before you get too excited, PC-Task is really only designed to run the simplest of DOS-based applications, so complicated PC programs like MicroSoft Windows and – dare I say it – Doom are definitely out of the question.

PC-Task fully supports a range of video display modes (including VGA – although not in 256 colours) and an MS-DOS boot drive can even be installed on your hard disk.

SnoopDOS 3.0

KEW=II U1123

Installing programs on to a hard disk or even from one floppy disk to another can be quite confusing. With SnoopDOS 3.0, however, all your installation problems are solved. It allows you to monitor a variety of system operations carried out by programs as they load.

This includes what files a program is attempting to open, what fonts, libraries, devices and environment variables it expects to find and so on. If a given program fails to find one of these resources, SnoopDOS will tell you what it expected to find and where it looked.

LeverEdge NAG

Fred Fish 761

LeverEdge NAG will remind you of events before you miss them. Events can be scheduled to occur once, or repeat daily, weekly, monthly or even yearly. You can be alerted of the event in a number of ways – from a screen flash to a message requester. Don't forget to load it first!

ARestaure

Fred Fish 760

Accidentally deleting a file can be frustrating, but it doesn't necessarily mean that you've lost your file for good. Not if you've got a copy of ARestaure, at least.

ARestaure lets you restore accidentally deleted files and works on all Amiga storage devices (floppy, hard disk and even RAD). It boasts a full intuition Interface and support for three different languages – English, French and German. An indispensible disk utility.

Fast Intro Maker

Fred Fish 814

Fast Intro Maker (or FIM) lets you create a bootblock intro for a disk that is loaded each time you boot your Amiga from that disk.

Your intro can consist of three elements: a picture, a Sound Tracker-format music module and some text. Once you've loaded these three vital elements, Fast Intro Maker pulls them together into a bootblock which can be installed on any floppy disk.

DPU

Fred Fish 721

DPU (short for Disk Peek and Update) is a powerful hex disk and file editor that enables you to access the data on a disk at a very low level. The program runs from a menu-driven front end that lets you select any AmigaDOS device which you can perform any number of operations on, including the ability to view its bitmap (how data is spread across the drive), check it for errors and even edit a file or the disk directly in hex.

SuperView

KEW=II V1175

SuperView is a powerful graphics tool designed to allow you to view pictures on your Amiga without having to resort to a paint program like DPaint.

Unlike most paint packages, however, SuperView can handle an array of different image formats – .GIF, .PCX, JPEG, .BMP and Targa formats being just five of the more common formats that it supports.

What's more, you can also convert between these formats so there's no reason whatsoever why you can't use SuperView to translate your friends' .PCX images to Amiga IFF format.

Lottery Winner

OnLine PD

If you're one of the millions of Britains that have gone National Lottery bonkers, then you simply have to get your hands on a copy of OnLine PD's Lottery Winner.

As well as generating six numbers suitable for the National Lottery game card, Lottery Winner also analyses past winning numbers to predict the most likely combinations. Simply feed it each week's lottery numbers and Lottery Winner will do the rest.

Lottery Winner also enables you to view the frequency of numbers over a set period of time, so you can see at a glance what numbers keep cropping up time and time again.

VCR

Fred Fish 721

Movie collectors will love this utility on Fish disk 721 which has been specifically written to cater for collectors of films on video tape.

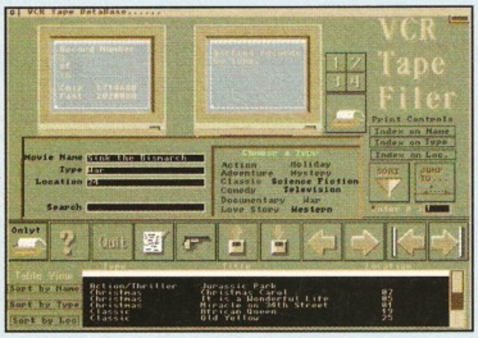
Based around a pretty high resolution front end, VCR can hold the film title, type and its location and you can use the program's comprehensive search function to find your favourite movies. It's a little limited, but it gets the job done.

A64

Fish Disk 555

A complete Commodore 64 emulator on a disk? You'd better believe it! What's more, it's highly compatible with most C64 games running under the emulator with little or no problems to speak of.

However, A64 does require a hardware interface (which can be bought from the authors for $40) which lets you connect a C64 disk drive and printer to your Amiga. Once connected, the contents of your C64 disks can be transferred to Amiga disks with ease. ■



Organise your extensive video tape collection with the VCR tape filer.

PD houses

This is your comprehensive guide to where to go to find the Public Domain program of your dreams.

17 Bit Software, 1st Floor Offices, 2-8 Market Street, Wakefield, West Yorkshire, WFI IDH. ☎ (0924) 366982, Fax (0924) 200943. Catalogue 50p or free if you send an s.a.e.. Accept phone orders, credit cards and direct debit. Open 8am – 8pm Mon – Thur, 9am – 5.30pm Fri – Sat.
A1200 Only PD – BJ Cowdall, 23 Barn Way, Cirencester, Gloucestershire GL7 2LY. Try to obtain all AGA PD and WB3 utils etc. Catalogue is £1.00 or send a disk and an s.a.e.. No phone orders or credit cards. For a printed catalogue just send an s.a.e.. Disks are £1.00 each. Frequent special offers!
Active Software, PO Box 151, Darlington, County Durham DL3 8YT. ☎ & Fax (0325) 352 260. EMail Bux8@unn.ac.uk. Specialise in professional collections, compile disk packs, essential Aminet compilations and sound samples. Catalogue 50p. No phone orders, credit cards or direct debit. Open 9am – 9pm. Discounts to User Group members.
Activity Software, 393 Doncaster Road, Rotherham, South Yorkshire, S65 2UF. ☎ (0709) 377730. Catalogue 1st class stamp. Do not accept phone orders, credit cards or direct debit.
Open from 9am – 5.30pm Mon to Sat. Additional info, also stock PC shareware. Crazy Joe's, 141 Effingham Street, Rotherham.
AGA Exchange, 18 Brownshill, Cromer, Norwich, Norfolk, NR27 0QA. specialist areas: AGA PD/shareware full advice service, PD exchanges, Laser printing service. Catalogue free (with s.a.e. + disk). No phone orders, credit cards or direct debit.
AmiCom PD, 22 Church View Close, Havercroft, Wakefield, WF4 2PH. Catalogue 50p. Do not accept phone orders, credit cards or direct debit.
Amiganuts, 3 Spring Road, Bitterne, Southampton, Hampshire, SO19 2BH. Specialist areas: Acc, Accm, Words 4, general software and titles produced by M. Meany. Catalogue, 50p + s.a.e. Do not accept phone orders, credit cards or direct debit. Open 24 hours a day, 7 days a week.
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Open 9am – 5.30pm.
Anim 1 PD, PO Box 128, West Malling, Kent, ME19 6UA. ☎ none. Specialise in Animation graphics. Catalogue cost 60p. No: phone orders, credit cards, direct debit.
Asgard Software, 20 Langdale Drive, Flanshaw, Wakefield, W Yorks WF2 9EW. ☎ (0924) 363 059. Specialise in all types of Amiga PD (approx. 4,000 disks in library). Catalogue is £1.00. No phone orders, no credit cards or direct debit. Open 24 hours.
Barkin Mad, 18 Rhyber Avenue, Lanark, Lanarkshire, ML11 7AL. ☎ (0555) 663530. Catalogue FREE when sending a s.a.e. and/or disk. Accept phone orders. Do not accept credit cards or direct debit. Open 24 hours – 7 days. We fully encourage swapping PD as well as selling to try to spread good quality PD as far as possible.
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Belshaw's Computers, 55 Balderton Gate, Newark, Notts. ☎ and Fax (0636) 72503. Catalogue FREE. Accept phone orders. Do not accept credit cards or direct debit. Open 9.30am to 5.30pm. Retail outlet, customers can call at shop.
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Chris's PD, 22 Merryfields Avenue, Hockley, Essex, SS5 5AL. ☎ (0702) 203826. Chris's PD disk catalogue 70p, 2 disk Fred Fish catalogue £1.40, both Chris's PD & Fred Fish disk catalogues £2.00 or Free if you send s.a.e. with sufficient disks. Do not accept phone orders, credit cards or direct debit. Open 6pm–8pm weekdays, 10am–4pm Saturdays. All disks are virus free & error free. All disks only 80p each.
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Club 1200, 57 Europa Rd, Lowestoft, Suffolk NR32 4BQ. ☎ (0836) 328 263. Specialise in AGA and WB3 only. Catalogue is £1.00. No phone orders, no credit cards or direct debit. Open 9am – 7pm Mon – Fri. One disk free for every five bought.
CPU Computer PD Library, 120 High Street, Chatham, ME4 4BY. ☎ + Fax: 0634 826 218. Catalogue cost £1.00. Open 9.30am – 5pm Mon – Sat.
Craig Holmes Non-Profit PD, 23 Rocester Avenue, Wednesfield, Wolverhampton, West Midlands, WV11 3AU. ☎ (0902) 305209. Specialist areas: latest virus checkers. Catalogue, free listing upon request. Do not accept phone orders, credit cards or direct debit. Open, mail order only – but phone enquiries 9am – 8pm, 7 days a week. Additional info, all discs £1.75 inc P&P. Bulletin board available on Sunday 2pm – 5pm only.
Cynostic, Office 01, Little Heath Industrial Estate, Old Church Road, Coventry, CV6 7NB. ☎ (0203) 681687, Fax (0203) 638508. Specialist areas: all latest demos, comprehensive utility section and complete coverage of the PD spectrum. Catalogue nil for paper, £1.00 for catalogue disk. Do not accept phone orders but will within 6 months. Do not accept credit cards or direct debit. Open 10am 6pm. We offer total product support, plus we can advise on any Amiga problem.
Dead Budgie PD, 53 East Street, Ashburton, devon TQ13 7AQ. 70p for two disks. Don't accept phone orders, nor credit cards or direct debit. They accept postal orders or cash – cash is sent at your own risk however.
Deck The Ripper of NFA PD, 173 Trevind Drive, Rushey Mead, Leicester LE4 7TR. ☎ (0533) 661 610. NFA productions are setting up a network of PD houses across the UK in an effort to get PD to the public as cheaply as possible.
Epic Marketing, Victoria Centre, 139 Victoria Road, Swindon, Wiltshire, SN2 3BU. ☎ (0793) 490988, Fax (0793) 514187. Specialists areas, desktop video fonts and tutorials. Catalogue £1.00. Accept phone orders and credit cards. Open 9.30am – 5.30pm Mon to Sat.
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Ground Zero, 4 Chandos Road, Redland, Bristol BS6 6PE. ☎ 0272 741 462.
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ICPUG (Independent Commodore Products Users Group), 45 Brookscroft, Lindon Glade, Croydon, CRO 9NA. ☎ 081/651/5436, Fax 081/651/3428.
Immediate Arts, 26 Lyndhurst Gardens, Glasgow, G20 6QY. ☎ 041/946/5798. Catalogue, catalogue disk £1.00 (P&P inc). Do not accept phone orders, credeit cards or direct debit. Open 9am to 6pm.
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NJH PD, 12 Meesons Rd., Rochford, Essex, SS4 1RN. ☎ / Fax: 01702 546 796 / 0585 348 786.
Numero Uno, 21 Burstall Hill, Bridlington, North Humberside, YO16 5NP. ☎ (0262) 671125. Specialise in a lot of A1200 stuff. Catalogue costs a blank disk or 1st class stamp. Phone orders accepted if buyer collects. Do not accept credit cards/direct debit. Open 4 – 10pm on Wednesdays, 9am – 1pm + 6.30am – 10pm on school holidays & weekends. 75p a disk, 50p P&P.
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Pathfinder PD, 41 Marion Street, Bingley, West Yorkshire, BD16 4NQ. ☎ (0274) 565205. Catalogue, Free if a s.a.e. is sent. Do not accept phone orders, credit cards or direct debit. Open 9.30am – 5pm. We have our 6,000 titles in our library and also our PC shareware.
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The Official Amos PD Library, 17 Wick Farm Road, St Lawrence Bay, Southminster, Essex, CMO 7PF. ☎ and Fax (0621) 778804. Specialist areas: Amos programs, source-code disks, totally Amos disk magazine. Catalogue £1.00 disk s.a.e. for printed info. Do not accept phone orders, credit cards or direct debit. Open, postal only orders, queries during reasonable hours. The only Amos-only PD library in the UK, with the longest running disk magazine.
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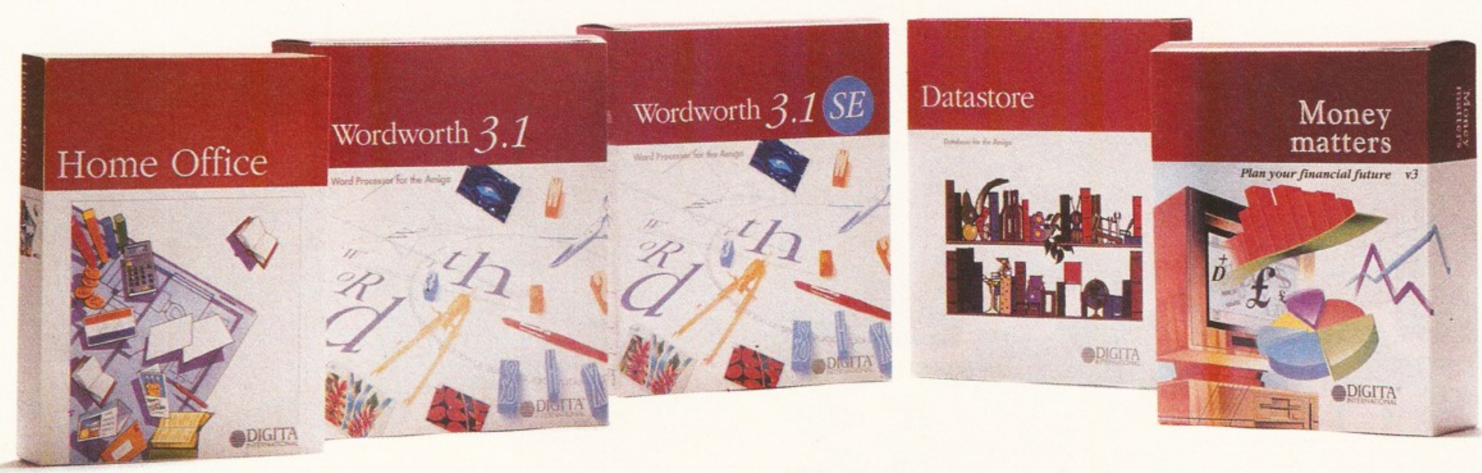
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Addlestone 1–1 Amiga Club.
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Ashford Kent Youth Computer Group.
Contact Jim Fanning ☎ 0233 629804.
Banstead Limited Edition Software.
Contact Les, 28 Congcroft Avenue, Banstead, Surrey SM7 3AE.
Beccles Waveney Amiga (WAM).
Contact Stephen Cockerell ☎ (0502) 711 888. 10 Hillcrest Close, Worlingham, Beccles, Suffolk NR34 7BY.
Bedford Nemesis Amiga Group, Andy Melbourne, ☎ (0234) 350654, 126 Mallard Hill, Bedford, MK41 7QT.
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Contact John Maynard ☎ 0277 218897.
Brighton Hanover Computer Club.
Contact Colin Jones ☎ 0273 602834.
Bromley ICPUG South East.
Contact len Beard ☎ 0689 830 934.
Bromtard Better Than Life.
Contact Mark Waters, 7 Linton Downs, Brotard, Herefordshire HR7 4QT.
Camberley Camberley User Group.
Contact F Wellbelove ☎ 0252 871545.
Cambridge Cambridge Sixty-Eight Group (CASE). Contact EPL Rowell ☎ 0954 210692.
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Deal Amiga Club Wayne or John, ☎ 01304 362297 or ☎ 01304 367 992, 27 Mill Hill, Deal, Kent, Meetings at St Johns Ambulance Hall, Mill Hill, Deal.
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Folkestone Amiga 101.
Contact D Cryer ☎ 0303 245 378.
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Contact Kevin Bryan ☎ 071-580 2000 Ext 240.
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Contact Imp ☎ 081 455 1626.
London (Winchmore Hill) Access Information Technology.
Contact Darren ☎ 0956 229729.
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Contact M.Macias ☎ 071/924/5528 before 6pm. 14 Totteridge House, 15 Yelverton Road, London, SW11 3QQ.
London Twilight
Contact 13 Mavis Court, Ravens Close, London, NW9 5BH.
Luton Plague Amiga Users Group.
Contact Russel Lewis ☎ 0582 484 514. 44 Moreton Rd. North, Luton LU2 9DP.
Luton Amiga Users Group.
Contact Dave ☎ 0582 481952.
Mundesley APDEG (Amiga Public Domain Exchange Group).
Contact Richard Brown ☎ 0263 720868.
Norwich AGA Exchange.
Contact K. Phillips, 18 Brownshill, Cromer, Norwich NR27 0QA.
Norwich Magic Windows.
Contact Frame, 26 St Benets Road, Stalham, Norwich, NR12 9DN.
Romford Digital Disk Amiga.
Contact David Cowell ☎ 081 590 2546.
Rye Rye Amiga Group.
Contact Oliver Campion ☎ 0797 222876.
Sittingbourne Sittingbourne Co-op Amiga Club.
Contact Andy ☎ 0795 842 608. The Bungalow, Keycol Hill, Newington, Sittingbourne, Kent ME9 8NA. Postal memberships offered. Support BBS ☎ 081 905 7002 (data).
Southend-on-Sea Southend Team.
Contact ☎ 0702 333974.
Sutton Agnus
Contact Philip Worrel, 115 Brocks Drive, North Cheam, Sutton, Surrey SM3 9UW.
Stockdale Amiga Owners Society.
Contact Jim & Wayne ☎ (0304) 380670 + (0304) 362297, 100 Stockdale Gardens, Deal, Kent, CF14 9BN.
Thetford Bizart Diskmag.
Contact Stephen Marghan, Timberton House, The Mount, Buckenham Tofts, Thetford, IP26 5HP.
Thornton Heath AmigaBASIC club.
Contact Imran Ahmad ☎ 081 689 9102.
Watford Hertfordshire Amiga Users Group.
Contact Keith Alexander ☎ 081 421 1784.
West Watford AmigaSoc
Contact Neil Cartwright ☎ 0923 248483.
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Contact Gary Bowen ☎ (0276) 479615, 11 Hutton Close, Thorn-down Lane, Windlesham, Surrey, GU20 6DN.
Witham Amiga Witham Users Group.
Contact K Anderson ☎ 0376 518271.
Worthing Imagine, Lightwave, Real 3D objects.
Contact Michael Moorfield, 4 St Botolphs Crt, St Botolphs Rd, Worthing, West Sussex BN11 4JH.
Yarmouth Robotronix Amiga Club.
Contact P Symonds ☎ 0493 667161

Southwest

Bodmin Amiga Users Klub (Bodmin).
Contact Jack Talling, 1 Windsor House, 19 Castle St, Bodmin, Cornwall PL31 2DX.
Bournemouth Amiga Club.
Contact P Chamberlain ☎ 0202 296714.
Bristol Avon Micro Computer Club.
Contact Roger or Bob ☎ or Fax 0272 311642.
Bristol Bristol Amiga Club. **Contact** 3 Parkstone Avenue, Horfield, Bristol BS7 0BX.
Bristol EmuSoft.
Contact Nalpex, 48 Longhandstones, Cadbury Heath, Bristol BS15 5AP.
Dukinfield C.C. Swapshop.
Contact Tom Hampson ☎ 061 339 9488.
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Contact Andrew Deeley/Phil Treby at 25A Gloucestershire Rd, Exwick, Exeter, EX4 2EF.
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Salisbury CHUD.
Contact Mr M Sellars ☎ 0980 33154.
Taunton Imagine Object Makers.
Contact Charles Mo, 16 Calder Crescent, Taunton, Somerset TA1 2NH.
Torquay Ami-Info.
Contact Paul Caparn, Homeside, Higher Warberry Road, Torquay, Devon TQ1 1SF.

Midlands

Birmingham 68000 in Birmingham.
Contact Mike Bedford-White, 16 Westfield Rd. Acocks Green, B'ham B27 7TL.
Birmingham Software Exchange Service.
Contact Michael Pun ☎ 021 459 7576.
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Contact Will Light ☎ 0203 413511.
Derby Living Poets Society. Publication and appraisal of creative writing.
Contact Sean Woodward. Fido 2:2503/104; 11. Menin Road, Allestree, Derby, DE22 ZNL, UK.
Hereford Hereford Amiga Group Help.
Contact John Macdonald ☎ 0981 21414.
Leicester NFA.
Contact NFA Productions (0533) 661 610. PO Box 323, Cambell St. Leicester.
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Contact Daz or Eddy ☎ 0533 375 147 or (0509) 267 198. PO Box 10, Mountsorrel, Loughborough, Leicestershire LE12 7ZZ
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Contact B Robinson ☎ 0392 72889 or ☎ 03922 841296.
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Contact Membership Secretary, PO Box 151, Darlington, County Durham DL3 8YT. ☎ 0325 352260
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105 Whittle Street, Walkden, Worsley, Manchester, M28 3WY
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Contact Nigel Rigby ☎ 0254 395289.
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Bathgate Lothian Amiga Users Group.
Contact Andrew Mackie, 52 Birniehill Ave, Bathgate, W Lothian EH48 2RR.
Cowdenbreath Amiga FX.
Contact Ryan Dow ☎ 0383 511 258.
Bo'ness C.P.C. User Group, Alistair Lyons, 18 Braehead, Bo'ness, West Lothian, Scotland, EH51 9DN.
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Contact Dave Thornton ☎ 0382 505437.
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Contact Stan Reed, 7 Maxton Place, Rosyth, Dunfermline, Fife KY11 2DG.
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Contact Derek Scott ☎ 0620 823137, (Saturday 1 – 4pm). Bridge Centre, Poldrate, Haddington, East Lothian, Scotland.
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Contact Stephen Fradley ☎ 031 555 1142.
Edinburgh Edinburgh Amiga Group.
Contact Neil McRea, 37 Kingsknowe Road North, Edinburgh, EH14 2DE.
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Contact Gordon Keenan, Amiga Helpline, 6 Skirsa Square, Glasgow G23.
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Contact Derek Scott ☎ 0450 373071. 26D Harden Place, Hawick, Borders, Scotland.
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Contact David Paulin ☎ 0463 242431
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Contact Alastair MacPherson 137 Glasgow Rd, Perth.
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Contact Ruby Anderson ☎ 0294 313624.
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Contact Alistair Lyons, 18 Braehead, Bo'ness, W. Lothian, Scotland EH51 9DN.

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Carmarthen Bloomfield Video and Computing.
Contact Mrs Beryl Hughes ☎ 0267 237522.
Clwyd ShieldSoft PD. Write to 26 Doren Avenue, **Rhyl**, Clwyd LL18 4LE, ☎ 0745 134 3044.
Clwyd Solo (Amiga).
Contact Mike, 26 Doren Avenue, Rhyl, Clwyd LU8 4LE. ☎ 0745 343044
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Contact Dave Thomas 4a, Allister St, Neath, W Glamorgan.)
Powys Blue Bedlam.
Contact Michael Grant ☎ 0873 811791.

N Ireland

N Ireland N. Ireland Amiga User.
Contact Stephen Hamer, 98 Crebilly Rd, Ballymena, Co Antrim BT42 4DS.
N Ireland Digital Intensity (diskmag).
Contact Simon Denvir, 40 Old Cave Hill Rd, Belfast BT15 5GT.

Special interests

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Contact J Lanng, 7 Majestic Rd, Hatch Warren, Basingstoke, Hants RG22 4XD.
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Contact D Beet Lock, Branston Fen, Lincolnshire LN3 5UN.
Braunston Nr Daventry GFA Basic Forum.
Contact J Findlay ☎ 0788 891197
Braunston Nr Daventry Amiga E Support Group.
Contact John Findlay ☎ 0788 891197.
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Highfields CDTV User Group.
Contact Gary Ogden, ☎ 0785 227059.
Lingfield In Touch Amiga.
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Lothian Independent Commodore Products Users Group.
Contact David Hope ☎ 0555 811 955..
Macclesfield Independent Commodore Products Users Group.
Contact Peter Richardson ☎ 0298 23644
Maidenhead Independent Commodore Products Users Group.
Contact Mike Hatt ☎ 0753 645 728.
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Contact Roger Hunt ☎ 0246 454280.
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Contact Mark Blackall ☎ 0924 892106.
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Contact Neil Hallam, 12 Meesons Mead, Rochford, Essex SS4 1RN.
Romford Phoenix Demo.
Contact Frank ☎ 081 597 4661.
Rotherham Marksman (Trojan Phazer user group).
Contact David Green, 67 Thicket Drive, Maltby, Rotherham, S Yorkshire S66 7LB.
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Wallington Bible Bureau.
Contact AD ☎ 081 669 7485.
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Contact Stu, 28 Churchfield, Ware, Herts SG12 0EP.
Witham Video Visuals.
Contact Chris Brown, 4 Lavender Close, Witham, Essex CM8 2YG.
Workington AMOS Programmers Group.
Contact John Mullen at 62 Lonssdale St, Workington, Cumbria CA14 2YD.

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Australia Amiga Users Group of Western Australia.
Contact Bill Sharpe-Smith PO Box 595, Clover- dale WA 6105 Australia.
Australia Comp-U-Pal.
Contact Comp-U-Pal, 116 Macarthur Street, Sale, Victoria 3850, Australia.
Belgium AUGFL vzw.
Contact Lieven Lema, Meesberg 13, 3220 Holsbeek, Belgium.
Denmark Danish AMOS user group.
Contact Tom Poulsen, DABG, postbox 127, 2640 Hedehusene, DK Denmark.
France Interceptor (Public Domain Softwares).
Contact Interceptor, 13 Avenue Jean Jaures, 73000 Chambery, France
France 16-32 Micro.
Contact F Moreau, 132 rue Jean Follain, 50000 Saint-Lo, France ☎ 315220 02.
France Maritime Amiga Club.
Contact CDR K Osei, GN Ships Refit Office, 51 Rue de la Bretonniere, 50105 Cherbourg, France. ☎ 33 33225447.
Germany Royal Air Force Amiga Club.
Contact Stan Young, HMF RAF Laarbruch, BFPO 43.
Germany Worldwide PD Club.
Contact Dave White, Berliner Strasse 39, 40880 Ratingen, Germany ☎ 02102 499729 (Germany).
Greece "Amiga Pros" User Group (member GAC)
Contact Stefanos Siopoulo 01 9349963
52 Silvrias Str, N. Smyrni 171 23, Athens, Greece.
Greece Amiga Athens club.
Contact Stefanos Papamichael, 9 Derfeld Rd, Patisia, 11144 Athens, Greece ☎ 01/2027973.
India Indian Amiga Friends.
Contact Bilal, 46 Paragon 405 Lokhandwaza Complex, Andheri (W), Bombay-400058.
Ireland Amiga Addicts.
Contact A Minnock, Clonkelly, Binn, Co Offaly, Ireland (send s.a.e.).
Ireland AMOS Users.
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Ireland City Centre Amiga Group.
Contact Patrick Chapman, 70 Ballygall Crescent, Finglas East, Dublin II, Ireland, ☎ 345035.
Ireland Commodore Users Group of Ireland.
Contact Geoffrey Reeves, c/o St Andrew's College, Booterstown Avenue, Blackrock, Co Dublin. ☎ +353 1 288 3863.
Ireland Navan Computer Club.
Contact Mark Arnold, Cannistown, Navan, Co Meath, Eire ☎ 046 21078.
Ireland Northside Amiga Group.
Contact William Kelling, 10/A Rainsford Avenue, Dublin 8, Ireland ☎ 01 532 807.
Ireland Software Exchange Club.
Contact Michael Lacey, Fern's Post Office, Enniscorthy, Co. Wexford, Republic of Ireland.
Malta HTS (Malta).
Contact K Cassar, Block 1 Flat, 6 H E Hal-Tmiem, Zejtun ZTN07 Malta ☎ 674023.
Malta Malta Amiga Club.
Contact Zappor, PO Box 39, St Julians, Malta, ☎ 440453
Portugal Centro Amiga/Via Lactea BBS
Contact Rui Costa, 351 01 888 2245/49, Largo do Marim Moniz-C,C, Mouraria, 1 loja 408-1100 Lisbon, Portugal.
Portugal Software Asylum.
Contact Sid Sanches, Portugal ☎ 062 831566. Apartado 6156, 3000 Coimbra, Portugal.
Singapore Singapore Sling.
Contact Eric Chai ML, Block 4 #14-413, Pandan Valley, Singapore 2159, ☎ 65 4680630.
South Africa Amiga Users Exchange (AUX).
Contact Ken Turner, 24 Du Plessis Avenue, Edgemead, 7441 Cape Town, S. Africa. Internet: kturner@aztec.co.za
Spain Amiga Aga Exchange (España)
Contact S I Steele, Calle Ribadavia, 16-8-1, Madrid, Espana 28029. In English only please.
Sweden 32-bit ware.
Contact 32-bit ware, Ekorrstigen 10, 147 63 Tumba, Sweden.
Switzerland Amiga User Group Switzerland
Contact AUGS ☎ ++41 34 45 3078. Bahnhofstr. 7, CH-3426 Aefligen, Switzerland. BBS: +41 (0) 62 44 32 27. We have our own Net on several Swiss Amiga BBSs called "AUGS-Net".
USA Japan Amiga Group.
Contact: Rick Gardaya, PSC 78 Box 3876, APO AP 96326 USA.

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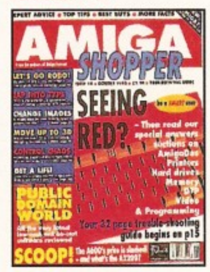
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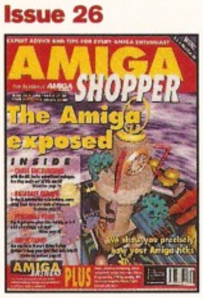
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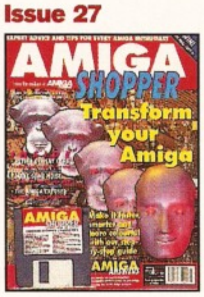
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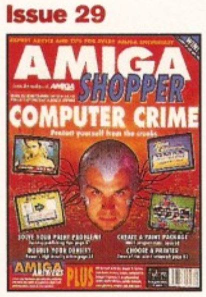
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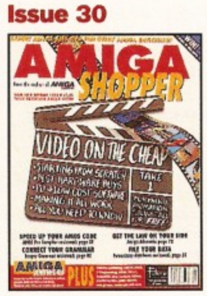
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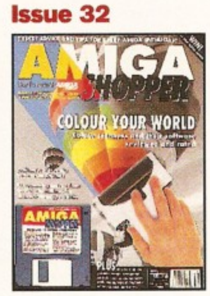
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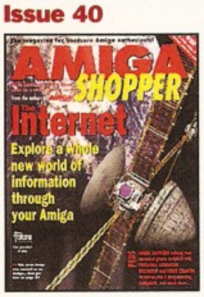
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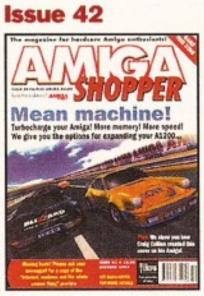
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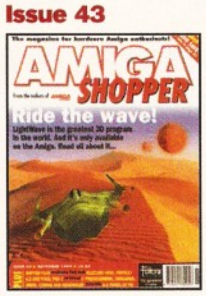
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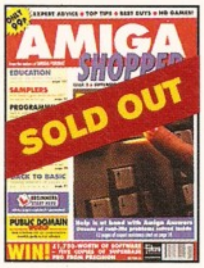


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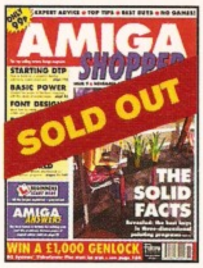
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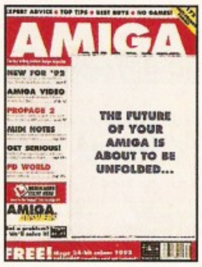

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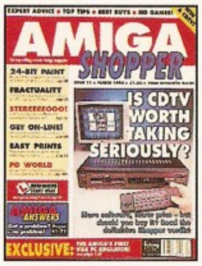

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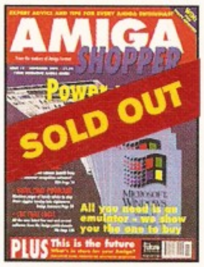
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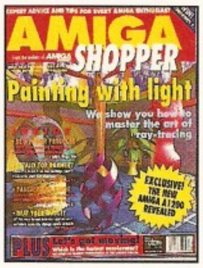

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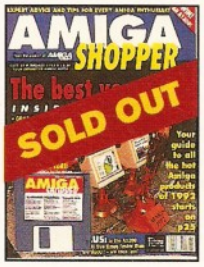
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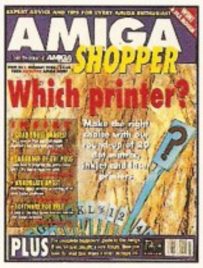
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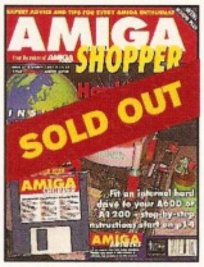
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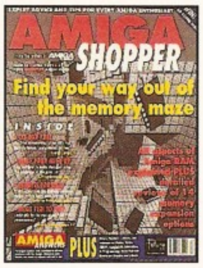
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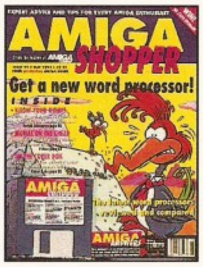
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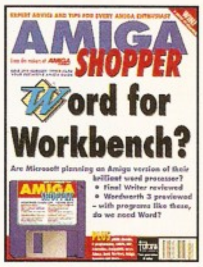
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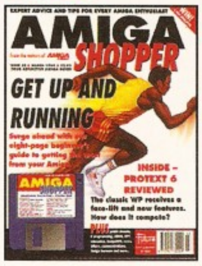
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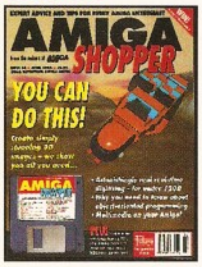

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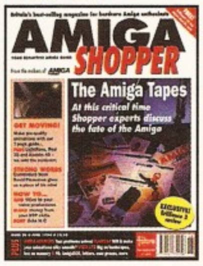
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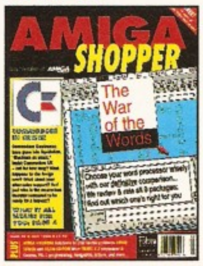
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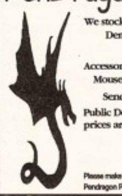
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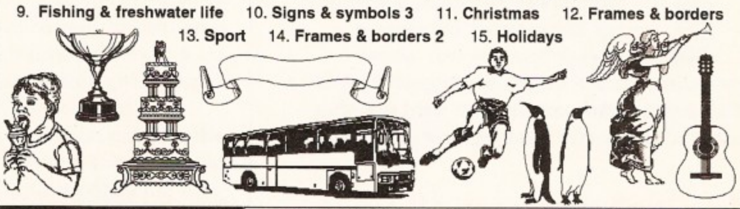
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Talking shop

Sue Grant *dons snorkel and flippers and dives into the Shopper postbag. She surfaces with some letters and a bad case of the bends...*

This month we're talking about the Amiga Shopper Subscriber's disks; we have a tip for printer owners; a correction for our chess program; and a caption competition for a £25 prize. And, remember that we give away £25 for the best letter every month.

Topical conversation

£25 Winner

I think the concept of releasing a subscription-only disk with the magazine was a very clever idea and I hope that it has realised its aim of attracting more Coverdisk freaks to take out subscriptions.

Whilst I have loaded one or two programs on to my own system, I don't find a lot of use for many of them. This, of course, is a personal view and I am sure there are users out there who have crammed every nook and cranny of their hard disk with these freebies to the point of not being able to run anything else.

So, what I am looking for is a Coverdisk which I can really use and, for that matter, which becomes almost indispensable to all of your subscribers and that is, of course, the cross-referenced index to articles and reviews which could be sent upon receipt of a new subscription or subscription renewal.

Being a hoarder of many magazines in differing fields, dating back to the fifties in some cases, I have found that the amount of time spent thumbing through old issues of magazines seem to increase dramatically.

Changing topic, at last, I still continue to subscribe to AS as it seem to be the only magazine that has kept its promise of attending to the needs of the serious, or at least serious amateur's needs without becoming too intellectual or technical – keep it up!

Bob Bosscher
Ramsey, Isle of Man

Well, Bob, there's a datafile on Coverdisk 2 for the Datastore Coverdisk that was on Amiga Format's February 1995 issue. With it, you can search for any feature or tip that has ever been printed in Amiga Shopper. (If you didn't buy a copy of that issue of Amiga Format, then contact their back issues department on the Hotline number ☎ 01225 822 511.)

As a subscriber you will now receive three Amiga Shopper disks every month. We will endeavour to bring you the finest Coverdisk programs we can find. See page 60 for subscription details.

And we will always try to keep the reader in mind when putting together the magazine – in fact, if you turn to page 49 and fill in our reader survey, you will be helping us in that aim.

Bits and pieces

Looks like I wrote just in time to get my letter on the glossy pages of the new-look Amiga Shopper, which sounds like it is going to be just the magazine I've been wanting to buy for so long now.

Mr Kier Derby
Reading, Berks

You sure did! And we hope that the new Amiga Shopper delivers the goods.

I have read in another magazine that M Tec have/are producing an 020 accelerator for the Amiga 600 range. Can you confirm this?

S. Harris
Bracknell, Berks

As far we know they have produced an 020 card for the A1200 only.

On another matter, why have the powers that be not done another print-run on the book "Complete Amiga C"? Would it be because Dillon is bringing out his own book, at £100 a time?

George McClelland
Isleworth, Middlesex

We haven't reprinted the book because it was bundled with software that we no longer have the license to print.

Buying advice

I own an Amiga 500 (1Mb), and am interested in buying a hard drive for it. I read an advertisement in your magazine for a hard drive of 127Mb for £169, from Total Computer Supplies Ltd. It would be much appreciated if you would tell me if this is a good price, sufficient RAM space for storing the Kindwords 3 word processor, Workbench 1.3 and selected games, and whether it is a reputable company to buy from. Are there other recommended companies in the London area for Amiga hardware and software?

Finally, is it worth buying a hard drive for the use of storing the above, when a disk drive could be sufficient?

Wesley Fogel
Edgware, Middlesex.

We have stopped taking any advertising from Total Computer Supplies as we have received several complaints against them from our readers. So, I suggest that you find yourself another supplier. Check out the advertising pages in this issue. There's sure to be a bargain or two!

Try Silica in Tottenham Court Road for Amiga accessories. Call them on ☎ 0181 309 1111. It would be a good idea to get yourself a hard drive to store your stuff – it would make your life a lot easier, especially with the word processor.

Phone home

Adam Chapman overlooked the exceptions to the rule to add a 1 after the 0 on area codes in your Subscribers' disk, issue 45. For example:

	Old code	New code
Leeds	0532	0113 2
Sheffield	0742	0114 2
Nottingham	0602	0115 9
Leicester	0533	0116 2
Bristol	0272	0117 9

And the extra 1 should not have been added to:

The 3 mobile phone codes
The 2 freefone codes 0500 and 0800
The 2 premium codes 0891 and 0898
The local code 0345

I also noticed that the only time difference given for USA/Canada was -5 hours. In fact, it varies from -3.5 (Gander Canada) to -11 (Alaska USA). Be ready for complaints from LA when folks are woken up three hours early.

Thank you for an, otherwise, excellent disk.

LG Rushbrook
Stevenage

Thanks for your corrections, LG. Don't forget that the new telephone dialling codes appear in April, so amend your address books now.

Pound saver

Here's a tip for those owners of Panasonic dot matrix printers who are considering upgrading their printers by the addition of the KX-P43 32K buffer Chip, at a cost of £40+. *Don't!*

Instead, get down to Maplin, plonk £7.60 on the counter, and ask the man for one of part number UH40T. This is a 32K x 8-bit CMOS Static RAM Chip, identical to the expensive Panasonic one. Fitting the Chip is a breeze; I have a KX-P2123 printer and did it like this:

Unplug printer from mains, remove paper, flatten knob, top cover and the clear plastic

Subjects of interest

£25 Winner

The new-look Amiga Shopper

We would welcome any comments on the re-birth of Amiga Shopper. We want to know what you think of the two Coverdisks and of the re-design.

If you have any suggestions for features, or anything else that you would like to see in your favourite Amiga magazine, then write to us at Talking Shop.

The star letter of the month gets £25. Now wouldn't that come in handy?

covers. Inside each of the two front corners of the printer there is a Phillips screw. Carefully remove these screws, taking care not to drop them into the works. The top part of the cabinet can now be lifted away (it's hinged at the back). Looking down into the back of the printer, an empty socket labelled 'Option Chip' can be clearly seen. There's only one, so you can't go wrong. This is where your expansion Chip goes. (Well I never!)

Before removing the Chip from its protective 'bubble', make sure that the normal precautions for handling static sensitive devices are observed, i.e. make sure that you are 'earthed'. Insert the Chip into the socket, making sure it is the right way round. The notch on the Chip goes toward the right hand side of the printer. Bingo! You now have a printer with a total of 46K of memory, at a fraction of the cost of the Panasonic upgrade.

Roger Merralls
Caerphilly, Mid Glamorgan

Has anyone else got any money-saving tips to share with Amiga Shopper's readers? If so, send them in to Talking Shop and we will print the best of them.

Checkmate

Let me get straight to the point without saying what an excellent and fantastic magazine Amiga Shopper is. In the December issue, in the chess masterclass, I discovered a slight error. On page 58 you said, about castling left... "If so, a castle move is possible and maxdist is set to 3".

I beg to differ, but when castling to the left, the king still only moves 2 squares, and the rook moves one square to the left of the king's start square.

To accommodate this error, I have altered the program so that line 68 of the program (not remarks) reads 'distmax=2' instead of 'distmax=3'. Are there any other changes I should make?

Christopher Howlett
Troon, Ayrshire

Thank you for your letter Christopher. I hope that it clears up any problems that other readers have experienced!

The last in our series of chess tutorials is on page 82. On Coverdisk 2, ShopperChoice, on the front of this issue, we have the complete chess listings and tutorials.

New from NewTek

I've got two questions and I hope you can help me in this matter.

1. I read the interview with NewTek president Tim Jennison in Amiga Shopper issue 44 with great interest. There were some applications mentioned I've never heard about, e.g. the 'Passport Transcoding TBC system'. It was said that the Toaster will work on PAL machines with this Passport System. How does it work, where can I get it and how much is it?

In addition, Mr Jennison talked about something called "Flyer", which is used to increase rendering speed. I know that for the production of SeaQuest DSV the 3D artists used another application called Screamer. How fast are these engines?

2. Last, I've got an easy question for you. Reading your subscribers' instructions, I was wondering what you mean by 'cheque must be.... drawn on a UK bank account'. Is the option of paying by cheque for the UK only?

Andreas Samland
Oelde, Germany

1. Your best bet is to contact Ramiga on ☎ 01690 770304 because they are selling the Passport Transcoding TBC system in the UK and should be able to tell you all about it. The Flyer is a processor/accelerator add-on which, again, Ramiga sell.

The Screamer and Flyer are pretty fast, but they aren't as fast as the Raptor (which is also distributed by Ramiga, as it happens).

2. We do not accept Eurocheques for subscriptions because the currency has to be negotiated. It basically means that we may have to ask you for more money if there is a shortfall.

If there wasn't an Amiga...

Due to the Commodore liquidation, I've been thinking about what computer I would buy if there wasn't another Amiga.

The Mac hasn't got the Amiga multitasking. The user interface (Finder) isn't as pretty as the Workbench 3, the PowerMac prices are too high, and the 680x0 Macs will be obsolete in one year.

On the PC side, Windows 3.x and MS-DOS are poor, and I don't like the way that Windows NT works (why do you need a Pentium and 16Mb for multitasking when the first Amiga 1000 is doing the same?). OS/2 is the only *real* PC choice, but I'm not fool enough to purchase obsolete and expensive hardware that can't do the job I can do with my Amiga 1200.

I want a RISC-based machine and a multitasking operating system, 24-bit graphics,

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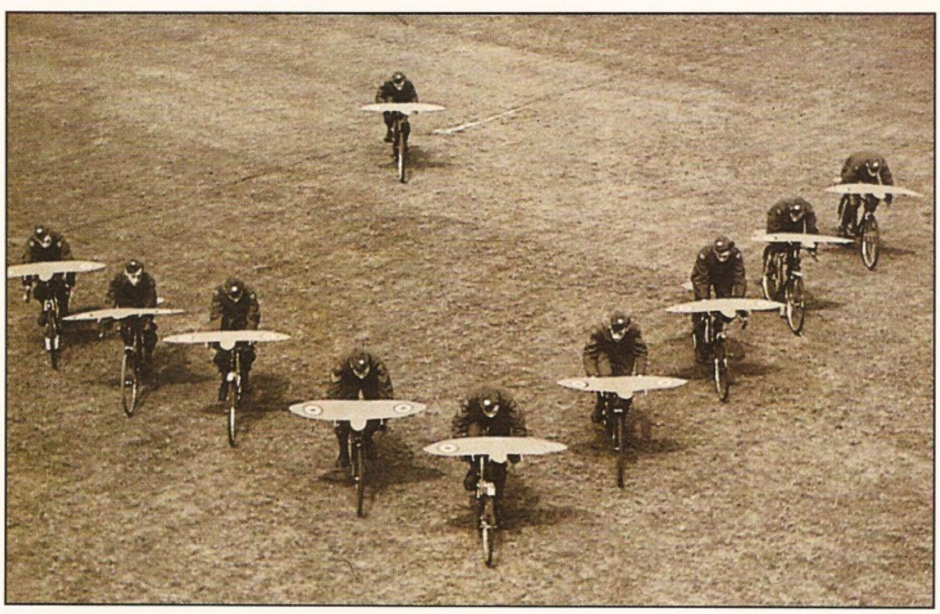
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Take a look at the back-cover of this issue of Amiga Shopper, then at the picture printed below. Can you come up with a witty Amiga Shopper- (or, indeed, Amiga-) related caption to use on the back-cover of a future issue? If your wit surpasses the Amiga Shopper team's (though we doubt it, of course), then we'll send you a cheque for £25.

If you think you can do better, then send your witticism to:

Can you do better?,
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Entries to arrive no later than Thursday, 16 March.



Pic: Hulton Deutsch

This picture was originally called Formation Training.

Write to **Talking Shop**

To add your contribution to any of the debates going on this page, send your letters to:

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All letters received at these addresses will be considered for publication unless you specifically advise us otherwise.

9 16-bit sound, and so on. I could go on, but nothing is better than my A1200 (except the A4000). I'm waiting to see the IBM Power Personal, but I think the next Amiga generation will be far better again.

About the new architecture, I think the problem is not the RISC processor (MIPS or PowerPC), but the operating system. They can change the complete Chipset, but the ROM Kernel is perfect. David Pleasance says the machine will run Windows NT. Will the new Amigas run a native Workbench too?

Enrique Jimenez
Madrid, Spain

Which only goes to show how user-friendly the Amiga is. And why there are still so many loyal Amiga-users around. We have been getting some positive feedback about the sale of Commodore, although nothing has been confirmed as yet. We hope to bring you more news in the next issue of Amiga Shopper as I intend to visit David Pleasance in the next couple of weeks. I will be asking him about any plans they have for the new Amigas then.

After care

I have been a devotee of the Amiga for over four years. Ever since my parents bought me an A500, I have never thought of switching to another platform – the Amiga is just such an amazing computer. I now use my Amiga for more serious work (an A1200, with a Blizzard A1230/II 50 Mhz, 6Mb in total, an Overdrive 250Mb hard disk). My Amiga ownership has not been without its problems though. This letter was typed on my fifth Amiga (2 A500s, 3 A1200s). Three of these have broken down or malfunctioned at one time or another.

My main point is this. Why is after-sales support so terrible? First, my dad has to phone ICL's hotline, which is an answering machine that doesn't cover any of the difficulties you may be experiencing. It asks you to press buttons on your phone for specific problems. Last time my dad phoned, he had to lie to get put through to an operator. Then the operator gets in touch with your nearest ICL branch (Glenrothes for me). Finally, around 10 days later an ICL "engineer" comes and says "Hmm... Looks like the motherboard, I'll have to give you a new Amiga". A few days after the engineer has left, just after Christmas, faults start to appear.

Wouldn't it be much easier if everyone was designated a specific phone number with their Amiga for their area, where they could pick up the phone and speak to someone local about their Amiga-related difficulties?

Barrie Hogg
Dunfermline, Scotland

Commodore's after-sales service has always left a lot to be desired, but this should hopefully change if the promised management buy-out goes through. Hopefully, Commodore will handle all warranty repairs themselves, rather than leave the work to a subcontractor such as ICL.

I beg to differ...

I've just been reading the LightWave issue of Amiga Shopper (Issue 43 – Australia is somewhat behind), and have a few comments.

Firstly, I find the overall mark of 89% quite remarkable considering the fact that it is probably the premier application available on the Amiga (or indeed, any home PC).

You were quite right about many of its shortcomings, but even with them it is surely worth more than 89%. I realise the mark given is probably against its own potential, but I'm not sure that rating an application against its own potential is a good idea.

Secondly, about the Modeling. I had used PovRay for a year when I bought LightWave, and have had few problems gaining complete control over the Modeler program.

The manual is admittedly of little use, but with practice it all becomes quite clear. I have also played around with Imagine and find the LW Modeler to be far more useable than the Imagine equivalent.

My point being that, again, I think 88% for 'ease of use' to be a huge understatement! The documentation sucks, but don't let that take anything away from the program itself.

Incidentally, John Goss is doing the entire manual for the next release. That should be a *vast* improvement over the current one.

Row, Australia

It's important to remember that our reviews only state the point of view of the reviewer and, as a result, ratings will vary (our sister magazine Amiga Format, for example, gave LightWave a massive 98%!). Rating a product on 'potential' is not a good idea, though – after all, there have been plenty of programs that looked good, but not all have managed to achieve that potential.

If we were to rate a product based on potential, we'd be marking a product for features that it didn't offer – a bit like giving DPaint 3 a good mark based on the merits of DPaint 4! ■

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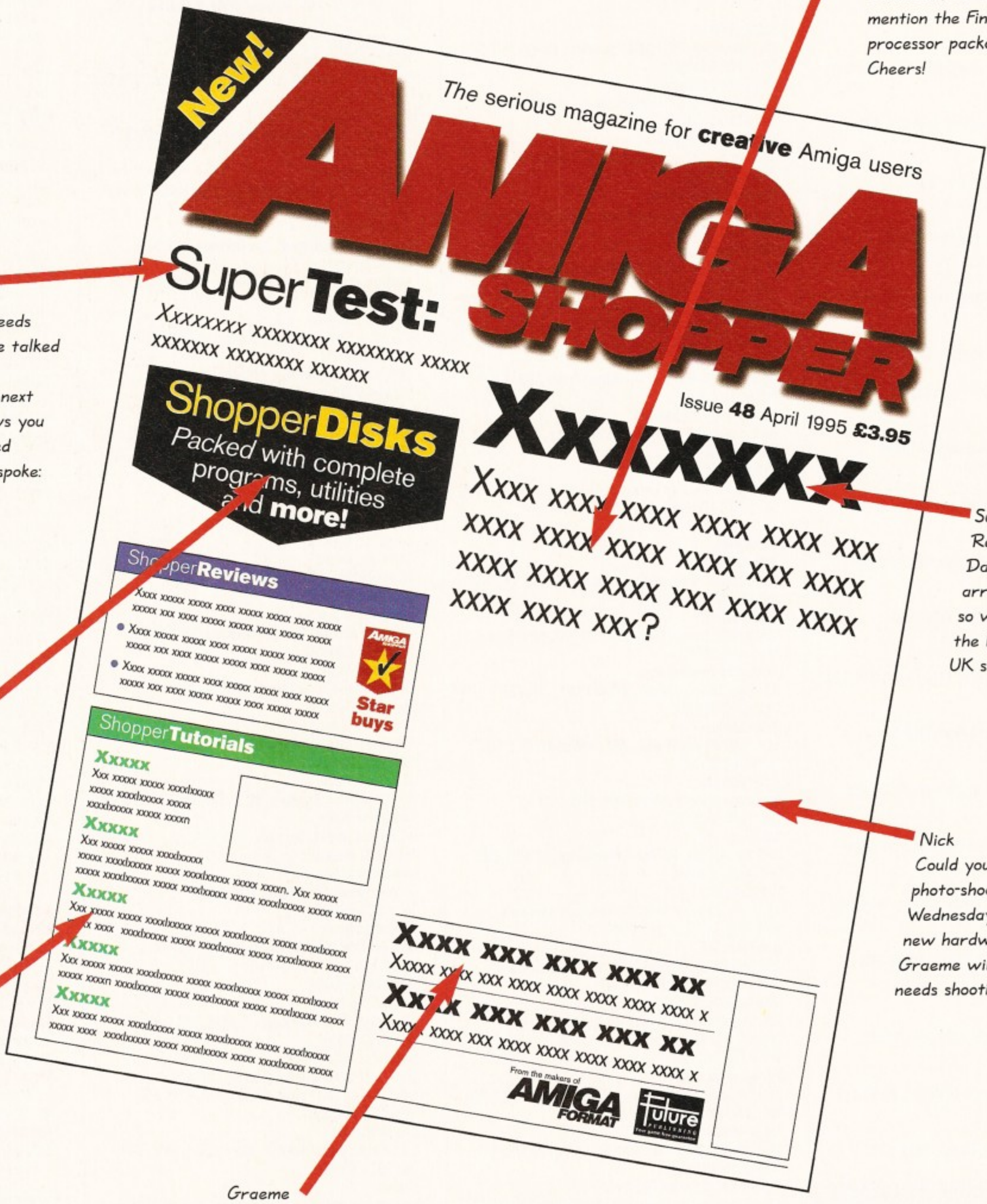
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Tel: 0224 592515

Next month

Anna
Can you call Shamms Mortier with the copydate for his interview with Woody Williams of Softwood. Oh and don't forget to mention the Final Copy word processor package review too. Cheers!

Graeme
Andy Bishop of Premier Vision needs contacting to get the feature we talked about underway.
Oh, and we need to sort out the next SuperTest and that list of reviews you gave me need chasing up. It looked something like this last time we spoke:

- *Pegger 2.0*
- *CD-ROMS*
- *Squirrel and stuff*
- *CanDo 3*
- *Infonexus vs Opus 5*
- *Termite and new modems*
- *Gamesmith*
- *Easy Ledgers 2*



Sue
Remember to phone David Pleasance to arrange an interview so we can talk about the latest Commodore UK situation.

Graeme
Ask Dale about the Coverdisk – he said he had something stunning in mind for the first of them. We'll have to get the instructions sorted out too.

Nick
Could you arrange the photo-shoot for next Wednesday? We need all the new hardware shots done. Graeme will tell you what needs shooting.

Sue
Remember to call Toby and the rest for their tutorials on:

- *Comms*
- *C programming*
- *Music*
- *Assembler*

Graeme
We must get the remaining Amiga Answers back from the experts. And could you get started on the Public Domain stuff?

April issue **48** on sale Tuesday **7th March**

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